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ABSTRACT

The nutrition education needs of Maryland school children, teachers, and food service personnel (FSP) were assessed during the 1986-87 school year, as a follow-up to a 1979-80 study. Materials developed by the Educational Support Services Branch (ESSB) were reviewed; the Nutrition Assessment Inventory (NAI) was given to 750 students each from grades 4, 8, and 11 and school personnel (SP); questionnaires were given to 306 FSP and SP; and site visits were made to six local education agencies. The materials were uniformly high in quality, attractive, and audience appropriate. Fourth graders in 1986 performed about as well as did their counterparts in 1980. Eighth and eleventh graders improved in many areas, but regressed in two areas each. Students were less likely to eat a nourishing breakfast or lunch as they grew older. The amount of support that FSP receive from SP, students, and the community dramatically improved. The findings indicate that nutrition education staff should: establish specific responsibilities for education liaisons, work with staff to expand the use of materials, expand the Nutrition Mission and promotional efforts, identify individuals showing an unusual enthusiasm for nutrition education, work to assure information dissemination, and continue efforts to encourage and inform FSP. The ESSB materials are appended. The sampling plan, questionnaires and supporting documents, and the NAI are provided in the Supplements section. (TJH)

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Maryland State Department of Education
Office of Administration and Finance
Educational Support Services Branch

Nutrition Education Needs Assessment

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MARYLAND NUTRITION EDUCATION NEEDS ASSESSMENT

FINAL REPORT
1986

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This study was conducted under a contract from the
Maryland State Department of Education, Educational Support Services Branch;
Program Assistance and Monitoring Section

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EXECUTIVE SUMMARY

An assessment of the nutrition education needs of Maryland school children, teachers, and food service personnel was conducted during the 1986-87 school year. This needs assessment was a follow up to a very similar study conducted in 1979-80. Thus, in a sense, this needs assessment serves as an evaluation of responses to the earlier assessment.

Results show that ESSB staff have responded to the recommendations of the 1979-80 needs assessment by developing a host of materials clearly focused on the needs of specific users. Materials reviewed included:

Activity Packet: *School Breakfast Week in Maryland*
Courses for Food Service Personnel (5)
Eating Breakfast -- Your Mission for Good Nutrition
Exploring Foods Workbook
Food and Nutrition Bulletin
Nutrition for the Health of It
Nutrition Mission and Supplementary Materials
Prep Talks and Related MSDE-Sponsored Inservice
Resource Lending System -- Directory of Media Materials
Salute to School Food Service Personnel
School Meals: A Winning Combination
Someone Is in the Cafeteria

Materials were uniformly high in quality, attractive, and audience appropriate. Collectively, the materials address all ten recommendations of the earlier needs assessment.

Test results revealed that fourth graders in 1986 performed about as well as their counterparts in 1980. Eighth and eleventh graders showed improvement in many areas but also regressed in two areas each. It is still true that students are less likely to eat a nourishing breakfast or lunch the older they get.

Survey results showed dramatic improvement in the amount of support food service personnel receive from principals, teachers, students, and the community. Salute to School Food Service Personnel is likely to be the source of this improvement. Interaction between food service and instructional staff remains minimal but both groups express higher levels of interest than in 1980.

Site visits showed that few nutrition education liaisons had authority to coordinate a real K-12 nutrition education program. Teachers use a variety of resources for nutrition education, often without assurance of their validity or relevance.

These and similar findings gave rise to seven recommendations:

1. Establish criteria and specific responsibilities for nutrition education liaisons.

2. Work with staff where contact is now strong to expand use of ESSB-developed materials.

3. Continue and expand Nutrition Mission.

4. Expand promotional efforts through such vehicles as the *Food and Nutrition Bulletin* and Salute to School Food Service Personnel.

5. Identify individuals who show unusual enthusiasm for nutrition education and provide them opportunities to expand their role in nutrition education.

6. ESSB staff should work closely with counterparts in other divisions of the MSDE to assure that reliable nutrition information is disseminated to teachers and others involved in nutrition education.

7. Continue efforts to encourage and inform food service personnel.

Specific actions are suggested to carry out these recommendations.

CHAPTER 1

INTRODUCTION

The Child Nutrition Act of 1966, as amended by Public Law 95-166 authorizes the federal government to formulate and carry out a nutrition information and education program through a system of grants to state education agencies. The goal of the Nutrition Education and Training Program (NETP) is to provide children with better opportunities to learn about food and nutrition and the relationship of food and nutrition to good health. In addition, the program is designed to provide opportunities for children, teachers, and food service personnel to use this knowledge to develop attitudes and practices fundamental to their health and well-being throughout life.

Each state receiving funds under this act is required to develop a plan for implementing the Nutrition Education and Training Program. Critical in the design of each state plan is the identification of specific nutrition education and training needs within the state. Specifically, states are required to assess the needs of students, teachers, and food service personnel and to determine the availability of curriculum materials or components. The needs assessment process attempts to identify discrepancies between an ideal and actual state of affairs. Furthermore, states are required to establish priorities or to rank order the needs identified. Development of a state plan goes beyond an assessment of the needs of students, teachers, and food service personnel or even a rank ordering of the needs, however. It requires the identification of possible means of meeting those needs, evidence of the effectiveness of each vehicle so identified, and an assessment of the likelihood of success of specific projects. The development of a state plan further involves the identification of populations to be served and the matching of resources to populations.

The purpose of this report is to assess the progress in nutrition education and training in Maryland since 1980. It was in 1980 that the first comprehensive statewide nutrition education needs assessment was conducted (Bunch, 1980). Many of the procedures and instruments used in the 1980 needs assessment were also used in the 1986 assessment.

Background

The 1980 needs assessment focused on the need for materials, courses, and procedures. A preliminary study had indicated that, in most cases, nutrition could not be taught in Maryland schools as a separate course; it must be integrated into home economics, health, social studies, science, reading, and mathematics. Therefore, an additional focus was the extent to which nutrition specialists worked cooperatively with classroom teachers from a variety of disciplines.

Ten major recommendations emerged from the 1980 needs assessment:

Students

- There should be a heavy emphasis on the development and/or selection of nutrient-related materials in classroom instruction, particularly at the early elementary grades.
- Steps should be taken to motivate older students to eat breakfast and lunch more frequently and to eat more balanced meals.

Teachers

- The training of teachers to work in nutrition education must emphasize the need for cooperation as well as methods for working cooperatively.
- Emphasis should be placed on how to obtain the assistance of food service personnel in nutrition education and training.

Food Service Personnel

- Food service managers should receive incentives for participating in nutrition education.
- Food service managers should receive incentives for participating in workshops and other training activities.
- All nutrition education of food service personnel must emphasize the need for close cooperation with teachers and other staff.
- Food service managers need more interaction with teachers and students than they presently have.
- Serious consideration needs to be given to development of an incentive program for food service workers to participate in training related to nutrition education.
- Food service workers perceive that teachers and students give almost no support to them. A major need for food service workers is the correction of this perception.

Because many of the major recommendations dealt with curriculum and procedures, much of the work of the Program Assistance and Monitoring Section of the Educational Support Services Branch (ESSB, the branch of the Maryland State Department of Education responsible for administering nutrition education and training programs) has been in the area of materials development. Other major activities of ESSB staff have included local and regional workshops, courses, seminars, and intense promotion of nutrition education materials. For the remainder of this report, all references to the ESSB will imply the Program Assistance and Monitoring Section unless otherwise specified.

As noted earlier, the present needs assessment was undertaken in order to assess the progress made in nutrition education in Maryland since 1980. Specifically, the authors set out to determine the extent to which the 1980 recommendations had been followed and to determine the effects of following those recommendations.

Overview

This report is divided into four chapters and an appendix. In addition, a set of supplements provides technical details beyond the scope of a report such as this one. Chapter 2 (Study Design) describes the procedures used in this needs assessment. Chapter 3 (Findings) presents the major results observed. Chapter 4 (Conclusions and Recommendations) summarizes the findings and provides an overall evaluation of the state of nutrition education in Maryland, along with recommendations for its improvement. The appendix gives a detailed assessment of materials developed by ESSB staff. The supplements include the instruments used to conduct the needs assessment, the complete sampling plan (with list of schools sampled), and the item-by-item results of the tests and questionnaires administered.

CHAPTER 2

STUDY DESIGN

Because nutrition education and training within the State of Maryland is fairly complex, a multi-methodological approach was taken in the conduct of this needs assessment. The following four activities were included in that assessment:

1. Review of materials developed by Educational Support Services Branch
2. Administration of the Nutrition Assessment Inventory (NAI) to students, teachers, food service managers, and food service workers
3. Administration of questionnaires to teachers, food service personnel, and building principals
4. Visits by needs assessment project staff to selected LEAs and schools

Each activity was designed to elicit a specific type of information. The intent of the authors was to combine all of the information in order to make recommendations about the future conduct of the nutrition education and training program. Each of the four activities is described is some detail below.

Review of Materials Developed by the ESSB

This review dealt with nutrition education and training materials developed by ESSB staff in response to the ten major recommendations emanating from the 1980 needs assessment. These included the following:

Activity Packets - *School Breakfast Week in Maryland*

Courses for Food Service Personnel (*Prepare With Pride, Menu Mastery, Serve Safe - Serve Smart, SuperVision, Speak Easy)*

Eating Breakfast - *Your Mission for Good Nutrition*

Exploring Foods Workbook (Developed by Maryland Department of Health and Mental Hygiene with NET Grant; reprinted and distributed by ESSB)

Food and Nutrition Bulletin

Nutrition for the Health of It

Nutrition Mission and Nutrition Mission Supplemental Materials

Prep Talks and related MSDE - Sponsored Inservice

Resource Lending System - Directory of Media Materials
Salute to School Food Service Personnel
School Meals: A Winning Combination
Someone Is In the Cafeteria

The review for each item includes an overview of its purpose and scope, a list of recommendations it addresses, and an overall evaluation. While other materials were examined in the course of the needs assessment, only those listed above were reviewed for this report. For example, the ESSB has adopted commercially prepared materials and those available from other states. Local education agencies, schools, and individual staff also presented a vast array of articles, packets, posters, games, and other resources. It would be far beyond the scope of this report to evaluate each such item in detail.

Administration of the Nutrition Assessment Inventory

The purpose of administering the Nutrition Assessment Inventory was to obtain an assessment of the nutrition-related knowledge, attitudes, and behaviors of Maryland students, teachers, and food service personnel. Four levels of the test were developed in 1979 specifically for the 1980 nutrition education needs assessment in Maryland. Each level measures five content areas: growth and development, balanced diet, nutrients, psychosocial aspects of food, and food processing and handling. Each of these five content areas is assessed with knowledge items, behavior items, and attitude items. Copies of these instruments are available in Supplement C.

Appropriate levels of the Nutrition Assessment Inventory were administered to samples of students in the fourth, eighth, and eleventh grades throughout the State of Maryland. Adult-level forms were administered to the teachers of these students as well as to food service personnel in the schools attended by these students. The sampling plan is outlined below.

The sample was designed in order to be representative of the state's student population in grades four, eight, and eleven. These grade levels were chosen by the authors in agreement with representatives of the Educational Support Services Branch. The sample was further delineated to represent four distinct segments of the population; namely, those students in districts characterized by high enrollment and high per-pupil allocations for food programs, students in districts characterized by high enrollment and low allocations, students in districts characterized by low enrollment and high allocations, and students in districts characterized by low enrollment and low allocations.

While sampling procedures are described in detail in Supplement A, a brief overview is given here. Figures from *The Fact Book 1985-1986* (MSDE, undated) were used to determine total enrollment and per pupil allocation for each LEA. Enrollment was taken from the last two columns of the table on page 7 (Elementary and Secondary). Per pupil allocation was derived by dividing the total value of federal aid (given on page 29) by the LEA's total enrollment (from page 7). Thus, for example, Allegany County had an elementary enrollment of 4,812, a secondary enrollment of 6,009, and a per pupil allocation of $95.74. For the fourth grade sample the state was divided into high and low enrollment based on the elementary enrollments. Since the total elementary enrollment in 1985-86 was 289,775, the LEAs designated as high enrollment were those large LEAs whose combined elementary enrollments totalled 144, 888 (i.e., half the state's total). This group included the three largest LEAs (Baltimore City, Prince George's County, and Montgomery County). Baltimore County, with the fourth highest enrollment would have caused the top group to be too large and was thus placed in the low enrollment group; i.e., had Baltimore County been included in the top group, then the total enrollment of that group would have been 167,938, or 58 percent of the state's total elementary enrollment. The three-LEA group had a combined elementary enrollment of 133,930, or 46 percent of the state's total.

For grouping by per pupil allocation, the LEAs were first ranked by allocation as described above. Then a dividing line was drawn at a point which would include approximately half the state's students above and half below. Given this sample design, it should be possible to generalize the results of the needs assessment to the entire student population for grades four, eight, and eleven.

The sampling unit was the classroom, rather than the student. The authors have found that classroom sampling is less disruptive and has other administrative advantages as well. Furthermore, the results obtained approximate those obtained by student level sampling if large numbers of classrooms are sampled. In this assessment, 30 or more classes of students were sampled for each of the three grades tested.

A sample size of 500 students per grade was projected. In order to obtain samples of 500 students per grade, the ESSB oversampled, sending out 750 instruments per grade rather than 500. The numbers of students targeted for testing are shown in Tables 1, 2, and 3. A more detailed listing of the schools involved in testing, as well as the numbers of classes and students at each school is available in Supplement B.

As noted previously, at least 30 classes of students per grade level were selected for testing. Specifically, 33 classes of fourth graders, 32 classes of eighth graders, and 31 classes of eleventh graders were selected for testing with the NAI. These classes also defined the sample of teachers to be tested. That is, each teacher of a tested class was also administered the adult level of the NAI. Accordingly, 96 teachers were selected for NAI administration. Not every class so selected actually participated in the testing. However, response rate was quite high. Details are provided in Chapter 3.

Within the schools where these teachers taught, a sample of food service personnel was selected such that the total number of food service personnel to be tested equalled the number of teachers to be tested.

Table 1
Summary Description of the Grade 4 Sample

	High Per Pupil Allocation		Low Per Pupil Allocation		Total
High Enrollment	Baltimore City	209	Montgomery County	143	352
Low Enrollment	Cecil County	22	Anne Arundel County	102	
	Charles County	27	Baltimore County	132	
	Garrett County	9	Frederick County	40	
	St. Mary's County	18	Howard County	42	
	Somerset County	6			398
	Subtotal	291	Subtotal	459	TOTAL 750

Table 2
Summary Description of the Grade 8 Sample

	High Per Pupil Allocation		Low Per Pupil Allocation		Total
High Enrollment	Baltimore City	184	Montgomery County	145	329
Low Enrollment	Cecil County	22	Anne Arundel County	114	
	Charles County	27	Baltimore County	143	
	Garrett County	10	Frederick County	40	
	St. Mary's County	17	Howard County	41	
	Somerset County	7			421
	Subtotal	267	Subtotal	483	TOTAL 750

Table 3
Summary Description of the Grade 11 Sample

	High Per Pupil Allocation		Low Per Pupil Allocation		Total
High Enrollment	Baltimore City	139	Montgomery County	183	322
Low Enrollment	Cecil County	21	Anne Arundel County	108	
	Charles County	32	Baltimore County	148	
	Garrett County	8	Frederick County	41	
	St. Mary's County	19	Howard County	46	
	Somerset County	5			428
	Subtotal	224	Subtotal	526	TOTAL 750

Questionnaire Administration

In order to determine the needs of teachers, school administrators, and food service personnel, the authors adapted four sets of questionnaires which had been used in the 1980 needs assessment. Each questionnaire was designed with a specific audience in mind. One questionnaire was designed to gather background information from school principals and to determine what sorts of interactions they had had with teachers and food service personnel in relation to nutrition education. A different questionnaire was designed for teachers. Food service managers received one type of questionnaire, while food service workers other than managers received a different type of questionnaire. These two questionnaires were designed to elicit background information about food service personnel and to determine the extent of their involvement in nutrition education. Copies of all four questionnaires as well as cover letters and other supporting documents are found in Supplement C. Individuals to whom questionnaires were administered were selected from schools included in the NAI administration such that 57 principals, 57 food service managers, 96 food service workers, and 96 teachers were sampled.

Site Visits

Six LEAs were selected to be representative of the 24 Maryland LEAs in terms of population, demographic characteristics, geography, and level of known nutrition education and training activity. The six LEAs were:

Baltimore City
Charles County
Garrett County
Howard County

Montgomery County
Wicomico County

Each LEA has a nutrition liaison who coordinates all nutrition education activities between the ESSB at the state level and teachers, food service personnel, and support staff at the local level. These individuals are selected by their local superintendents and in 1986 included seven food service supervisors, five home economics supervisors, five health supervisors, four curriculum supervisors, and three others. The nutrition liaison served as the primary contact for the site visit. Arrangements were made for the authors and an ESSB representative to meet with the liaison, tour local schools, interview instructional and food service staff (as well as administrators), review local policies, interview district level staff, and debrief. A sample agenda is given below.

Sample Site Visit Agenda

a.m.	9:00	Meet liaison
	9:45	Review policy and other pertinent documents
	10:30	Visit School #1
		Interview principal
		Observe in classroom/interview teachers
		Tour school
p.m.	12:00	Lunch at School #1
	1:00	Visit School #2
		Interview principal
		Interview food service manager and staff
		Observe in classroom/interview teachers
		Tour school

The tours and interviews with various staff were excellent opportunities to observe the level of cooperation among supervisory, food service, and instructional staff. By eating lunch in a school on each site visit, the authors were able to discern the level of effort put forth by school staff to display nutrition information (posters, student-developed bulletin boards, awards), level of participation in the lunch program, and degree of rapport between food service personnel and students.

Analysis Procedures

The procedures described above were selected to assess needs from several vantage points. Data analysis techniques were fairly simple and straightforward, as was the case in the previous needs assessment. Responses to the Nutrition Assessment Inventory and the questionnaires were tabulated to determine levels of knowledge and the extent to which various beliefs were held and different behaviors practiced. Particularly with respect to NAI results, data from the 1986 administration were compared with results obtained in 1980. These comparisons provided perhaps the best assessment of change and response to the earlier needs assessment.

Because subtest and total test means were not available for 1980, the comparison was at the item level using the Z statistic (Marascuilo, 1979, p.318). Given the fact that 59 pairs of values were available for comparision, the significance level was set at a level where only one Z value in 100 would be significant by chance alone. Thus any value of Z greater than or equal to 2.58 was considered significant.

Summary

Each procedure assessed progress in nutrition education from a slightly different perspective. Each procedure was designed to overlap to some extent with all other procedures. Thus, it was possible to double check findings and fit several pieces of a fairly large puzzle together with some degree of confidence. The results of these assessments are presented in the next chapter.

CHAPTER 3

FINDINGS

The primary focus of this chapter is on whether or not goals were met and the accompanying explanations. While the previous chapter described the data gathering and analysis methods, in this chapter the results of those analyses are discussed, first by procedure or instrument, and then by recommendation.

Materials Review

A synopsis of the reviews of the fourteen major sets of materials developed by ESSB staff is provided here. For a complete evaluation, the interested reader is directed to the appendix found at the end of this report.

Activity Packet: *School Breakfast Week in Maryland.* A new packet has been developed for School Breakfast Week every year since 1981. The packets include press releases and names of contact persons for additional assistance. The packets address five of the ten major recommendations and are very well developed. They include activities appropriate for all age levels and are appropriate for teachers as well as food service personnel.

Courses for Food Service Personnel. These courses have included *Serve Safe-Serve Smart, Menu Mastery, Prepare With Pride*, and *SuperVision*. A fifth course, *Speak Easy*, was under development for field testing in June, 1987. All courses are for food service personnel. The courses are well-planned (a great deal of local participation in development characterizes the courses) and include handouts, audiovisual materials, and instructors' manuals. They collectively address three major recommendations.

- *Prepare With Pride* focuses on quantity food preparation for school food service personnel. With a variety of audiovisual aids, this course includes meal production, labs, recipes, equipment use and care, and nutrition.

- *Menu Mastery* is designed to help managers plan well-balanced, cost-effective menus that students will accept. Divided into three parts, the course covers menu planning, purchasing, and receiving and storage. Several different teaching strategies and materials are used, including films, slides, games, and individual as well as group excercises.

- *Serve Safe-Serve Smart* helps food service workers learn to handle food in a safe and sanitary manner. Its two sections deal with food temperature as it relates to bacterial growth and general safety and sanitation procedures as well as portion control and offer vs. serve.

- *SuperVision*, designed to teach management concepts, supervisory skills, and communication techniques, was undergoing final revision and was not available for review.

- *Speak Easy* was under development and will be field tested in 1987. It too was not available for review.

Eating Breakfast - Your Mission for Good Nutrition. This pamphlet is provided to school food service managers to distribute to students. The material is appropriate for parents and older students. It is also helpful for principals and the general public. Attractive and readable, the pamphlet addresses two major recommendations.

Exploring Foods Workbook. This workbook is designed to help preschool children learn about foods, where they come from, and how to enjoy new foods. It is an excellent resource for use in preschool programs and by day-care workers, kindergarten teachers, or parents. It addresses one major recommendation as well as several secondary recommendations. This workbook was developed several years ago with a grant from NET. The ESSB now reprints and distributes the workbook.

Food and Nutrition Bulletin. This is a quarterly newsletter mailed from the ESSB to food service supervisors and nutrition liaisons in each school district and distributed to all public schools in the state. It is also distributed to non-public schools and child care facilities participating in child nutrition programs. Its purpose is to provide new information and to recognize the accomplishments of food service personnel statewide. It is both instructive and promotional. In this respect it addresses four major recommendations.

Nutrition for the Health of It. This is a compilation of nutrition education activities for home economics classes. This excellent resource addresses two major recommendations. Its use of varied media and approaches is sure to attract and hold student interest.

Nutrition Mission and *Nutrition Mission* Supplementary Materials. This is a three-hour inservice program for elementary teachers. While several specific topics are covered, a major focus is promotion of nutrition education through cooperative efforts. Iron-on patches, all-weather strips, stickers, buttons, stationary, and activity sheets are intended to get the message of good nutrition and health to principals, teachers, food service personnel, and others. Because all items are distributed by the school food service manager, he or she becomes a key figure, interacting with all other audiences.

This inservice program for elementary teachers focuses on nutrition education strategies. The four videotapes demonstrate effective methods and highlight current information. Teachers completing the training should be well prepared to teach nutrition concepts to children in a way that holds their attention and motivates them.

Implementation of *Nutrition Mission* began in 1985 and is still in process. These materials address five of the ten major recommendations of the 1980 needs assessment. It is exceptional in concept and development. Materials are of professional quality and include films and other activities. Videotapes feature John Burstein, better known as Slim Goodbody, a popular children's television character. This program serves, in a sense, as the flagship of ESSB-developed materials and it serves admirably. The supplementary materials include books and audiovisual aids. All age groups are represented. Schools receive some but not all of the materials because of budgetary constraints. They are an excellent supplement to Nutrition Mission and help teachers understand nutrition principles as well. They address one of the major recommendations listed earlier.

Prep Talks and Related MSDE-Sponsored Inservice. Prep Talk is an annual series of staff development programs conducted by the ESSB for individual LEAs. ESSB develops inservice plans as well as training packets. Audiences are typically public school food service staff but have also included nonpublic school and child care staff. These inservice training programs are designed to increase the knowledge, skills, and awareness of food service personnel. Fifteen different lesson plans were reviewed and more are developed each year. A great deal of thought is reflected in the materials. Prep Talks meets two major recommendations and three other recommendations listed in the 1980 report.

Resource lending system - Directory of media materials. A statewide lending system was instituted in 1983. The Directory is updated each year and mailed to all nutrition liaisons, child care centers, and food service supervisors in the state. The collection is impressive and comprehensive, addressing two major recommendations listed above.

Salute to School Food Service Personnel. This program was implemented in response to requests from local school officials for a way to show appreciation for food service personnel. The program has been very successful because it includes everyone in the system, starting with the superintendent. The status of food service personnel has been enhanced thereby not only addressing but also satisfying two major recommendations.

School Meals: A Winning Combination. This brochure, distributed to parent groups and the general public, promotes school lunch and breakfast. It is attractive, informative, and audience appropriate. It meets one of the major recommendations listed earlier.

Associated with *School Meals: A Winning Combination* is a 5' x 8' display board which can be used to promote the school lunch and breakfast programs. The brochure graphically depicts the theme that children who eat school meals are better nourished and that fewer children skip breakfast in schools which have a breakfast program.

Someone Is In The Cafeteria. This pamphlet is provided to school food service managers and local chapters of school food service associations. It stresses the importance of the lunch program and is intended for parents and the general public. The pamphlet is attractive, professionally rendered, and audience appropriate. It addresses one major recommendation listed earlier.

Summary. All ten recommendations of the 1980 needs assessment final report have been addressed. This finding represents a major accomplishment for the ESSB. Quite aside from their own materials, ESSB has promoted programs of other agencies such as the American School Food Service Certification program. Moreover, materials are of uniformly high quality, are varied in format and medium, and are typically appropriate for the audiences for which they were intended. Table 4 reiterates the ten recommendations and identifies the materials addressing each one.

Table 4
Recommendations Addressed by ESSB-Developed Nutrition Education Materials

Recommendation	Materials
1. There should be a heavy emphasis on the development and/or selection of nutrient related materials in classroom instruction, particularly at the early elementary grades.	Activity Packet-*School Breakfast in Maryland; Exploring Foods Workbook; Nutrition For the Health of It*; Nutrition Mission; Nutrition Mission Supplementary Materials
2. Steps should be taken to motivate older students to eat breakfast and lunch more frequently and to eat more balanced meals.	Activity Packet-*School Breakfast in Maryland; Eating Breakfast; Nutrition For the Health of It; School Meals: A Winning Combination; Serve Safe - Serve Smart*
3. The training of teachers to work in nutrition education must emphasize the need for cooperation as well as methods for working cooperatively.	Activity Packet-*School Breakfast in Maryland*; Nutrition Mission
4. Emphasis should be placed on how to obtain the assistance of food service personnel in nutrition education and training.	Activity Packet-*School Breakfast in Maryland*; Nutrition Mission; Resource Lending System-Directory of Media Materials
5. Food service workers should receive incentives for participating in nutrition education.	*Food and Nutrition Bulletin*; Prep Talks; Courses for Food Service Personnel (all 5)
6. Food service managers should receive incentives for participating in workshops and other training activities.	*Food and Nutrition Bulletin*; Prep Talks; MSDE-Sponsored Inservice Education Courses
7. All nutrition education inservice training of food service personnel must emphasize the need for close cooperation with teachers and other staff.	School Breakfast Week; Nutrition Mission; *Food and Nutrition Bulletin*

Table 4 Continued...

Recommendation	Materials
8. Food service managers need more interaction with teachers and students than they presently have.	Activity packet-*School Breakfast in Maryland; Eating Breakfast;* Nutrition Mission; *Someone Is in the Cafeteria; Speak Easy*
9. Serious consideration needs to be given to the development of an incentive program for food service workers to participate in training, particularly training related to nutrition education.	*Food and Nutrition Bulletin*; Prep Talks; Salute to School Food Service Personnel; Courses for Food Service Personnel (all 5)
10. Food service workers perceive that teachers and students give almost no support to them. A major need for food service workers is the correction of this perception.	*Food and Nutrition Bulletin*; Nutrition Mission; Salute to School Food Service Personnel; Prep Talk-"Speak Out on Child Nutrition"

Nutrition Assessment Inventory

Response rate to the NAI was as good as or slightly better than anticipated. Tables 5 and 6 show that, except at the adult levels, NAI results are very representative of the state as a whole. Respondents were not asked to indicate LEA or school; therefore summaries by these variables were not possible.

Table 5
Nutrition Assessment Inventory Responses

Level	Responses Desired	Original Sample	Valid Responses	Response Rate
Intermediate	500	750	503	67%
Junior High	500	750	668	89%
Senior High	500	750	487	65%
Adult	100	150	63	42%

Table 6
Demographic Composition of NAI Respondents
(Entries are percentages)

	Race			Sex			
Level	Black	White	Other	Female	Male	Public	Nonpublic
Intermediate	9	84	7	53	47	95	5
Junior High	24	68	8	54	46	87	13
Senior High	20	75	5	66	34	98	2

With regard to sex, the sample was fairly evenly divided at the intermediate and junior high levels. Far more female students took the senior high level, reflecting the fact that many NAIs were administered in home economics classes. At the adult level, women outnumbered men four to one, reflecting the fact that most teachers and food service personnel are women. While approximately 14 percent of the state's elementary and secondary enrollment is nonpublic, approximately 7 percent of the NAI responses came from nonpublic schools. No attempt is made to draw conclusions about nonpublic schools.

Results are presented in Tables 7-9 in comparison to the results of the 1980 needs assessment. In general, there was little difference between 1980 and 1986 in terms of students' knowledge, behaviors, and attitudes. For example, while more fourth graders could identify a balanced meal in 1986 (46 percent vs. 39 percent in 1980), more fourth graders also reported that they seldom or never ate the school lunch (32 percent in 1986 and 28 percent in 1980 seldom or never ate the school lunch).

Table 7
Comparison of Nutrition Assessment Inventory Results For Fourth Graders in 1980 and in 1986

Category	1986	1980	Response
GROWTH & DEVELOPMENT	21%	25%	Knew that a child's development is affected by diet
BALANCED DIET	46%	39%	Could correctly identify a balanced meal
	17%	16%	Knew that the school lunch provides 1/3 of all nutrient needs
	28%	34%	Knew why breakfast is important
	32%	28%	Could tell how many servings of milk are needed each day
	37%	31%	Seldom or never ate fruit or drank juice
	32%	28%	Seldom or never ate the school lunch

Table 7 continued

NUTRIENTS	48-71%	50-75%	Thought vitamins give energy (3 different questions: 19, 23, and 26)
	12%	11%	Could tell where we get energy
PSYCHOSOCIAL ASPECTS OF FOOD	26%	26%	Knew that the first ingredient on a food label is the highest in content
	51%	45%	Believed too many bad things are put into our food
	36%	36%	Believed that raw foods are better than canned or frozen

Table 8
Comparison of Nutrition Assessment Inventory Results of Eighth Graders in 1980 and in 1986

Catagory	1986	1980	Response
GROWTH & DEVELOPMENT	32%	22%	Knew that the greatest need for nutrients is from birth to two years
BALANCED DIET	32%	32%	Knew how many servings of fruits or vegetables are needed each day
	24%	30%	Knew that the school lunch provides 1/3 of all nutrients
	38%	35%	Seldom or never ate breakfast
	59%	60%	Seldom or never ate a Type A school lunch
	50%	43%	Spent more money on junk food than on other kinds of food
NUTRIENTS	43%	31%	Knew why fruits and vegetables are good for them
	23%	11%	Knew where we get fiber
	13%	12%	Knew which foods are high in fat
	17%	17%	Knew the function of Vitamin C
	33%	30%	Knew that people need fat
	43%	42%	Thought vitamins give energy
	22%	19%	Could identify fat soluble vitamins
	44%	14%	Knew which foods contain sugar
	58%	40%	Thought counting calories is a waste of time

Table 8 Continued.

PSYCHOSOCIAL ASPECTS OF FOOD	21%	24%	Knew what is on a food label
	79%	85%	Seldom or never read a food label
FOOD SOURCES, PROCESSING & HANDLING	67%	67%	Seldom or never helped prepare meals at home
	33%	42%	Thought cafaeteria workers are not concerned about food waste
	80%	37%	Could define vegetarianism
	72%	64%	Believed that modern food processing has destroyed most of the nutrients in our food
	67%	62%	Believed that additives are harmful

Table 9
Comparison of Nutrition Assessment Inventory Results
of Eleventh Graders in 1980 and in 1986

Category	1986	1980	Response
GROWTH & DEVELOPMENT	79%	36%	Knew the relationship between activity and caloric intake
BALANCED DIET	32%	22%	Could identify the food group to which nuts and dried beans belong
	29%	22%	Skipped meals often
	22%	22%	Skipped meals sometimes
	53%	48%	Seldom or never ate breakfast
	52%	54%	Seldom or never ate a school lunch
	68%	65%	Did not believe lunch is important
	51%	50%	Believed school lunches are nutritious
	39%	48%	Believed school lunches are a bargain
NUTRIENTS	87%	88%	Seldom or never counted calories
	25%	25%	Knew about complex carbohydrates
	40%	11%	Could identify a food that does not contain sugar
	15%	12%	Could identify a food low in fat
	38%	30%	Could identify a food high in protein
	19%	14%	Could identify foods high in Vitamins A and C
	36%	31%	Knew that people need fat in their diets
	30%	29%	Could identify foods low in protein
	22%	19%	Could identify fat soluble vitamins
PSYCHOSOCIAL ASPECTS OF FOOD	33%	37%	Could define vegetarianism
	79%	88%	Seldom or never read food labels
	22%	17%	Believed nutrition information on labels is useless

Table 9 Continued.

FOOD SOURCES, PROCESSING & HANDLING	72%	64%	Believed that modern food processing has destroyed most of the nutrients in our food
	67%	63%	Believed that additives are harmful
	77%	57%	Were concerned about world hunger

Statistical analysis of results in Tables 7-9 revealed only one significant improvement in grade 4, six in grade 8, and 7 in grade 11. Moreover, eighth graders in 1986 performed significantly worse than their 1980 counterparts in two areas and eleventh graders in 1986 regressed in two areas. To summarize these findings of significant improvements since 1980:

- More fourth graders could recognize a balanced meal.
- More eighth graders knew that the greatest need for nutrients is birth to two years.
- More eighth graders knew why fruits and vegetables are good for them.
- More eithth graders could identify sources of fiber.
- More eighth graders knew which foods contain sugar
- More eighth graders thought cafeteria workers were concerned about plate waste.
- More eighth graders read food labels.
- More eighth graders could define vegetarianism.
- More eleventh graders could relate caloric intake to activity levels.
- More eleventh graders could identify the food group to which nuts and beans belong.
- More eleventh graders could identify a food that does not contain sugar.
- More eleventh graders could identify foods high in protein.
- More eleventh graders read food labels.
- More eleventh graders were concerned about world hunger.

At the same time:

- More eighth graders spent more on junk food than on other types of food.
- More eighth graders thought counting calories is a waste of time.
- More eleventh graders skipped meals often.
- Fewer eleventh graders thought school lunch is a bargain.

For the past several years, ESSB attention has been primarily on materials development. As emphasis shifts to materials dissemination and program improvement, the figures in Tables 7-9 should change more dramatically.

Questionnaires

Results of the NAI administration have begun to suggest who is actually involved in nutrition education and to what extent. The questionnaires completed by principals, food service managers, teachers, and food service workers shed additional light on this issue. Table 10 shows the numbers of responses received from each group.

Table 10
Questionnaires Received

	Principals	Food Service Managers	Teachers	Food Service Workers
By Age				
Under 30	1	1	10	1
30-49	26	13	35	36
50 or Over	14	18	8	23
By Sex				
Female	22	28	49	49
Male	15	1	14	3
By School Type				
Elementary	19	16	19	22
Middle	5	5	13	13
Junior High	2	5	6	5
Senior High	10	14	25	27
Other	2	3	2	5
Length of Service				
Less than 1 year		0		1
1-3 years		3		12
3-7 years		15		15
More than 7 years		14		33
Total	40	36	65	61

The numbers in Table 10 are slightly lower than the ESSB had hoped to receive but the demographic characteristics seem to be fairly representative of the state as a whole. Therefore, it seems safe to use the information contained therein.

Principals. Few principals (three out of 40) had participated in Nutrition Mission. Most were aware that some form of nutrition education was going on in their schools and virtually all believed that nutrition was important to the health of students. Eighty percent tried to limit sales of candy and soft drinks and an equal number encouraged teachers and food service personnel to work together. These findings stand in contrast to statements of principals surveyed in 1980. At that time only 62 percent limited sales of candy and soft drinks, but 80 percent encouraged cooperation.

Food service managers. Many managers (33 percent) were not full-time managers. Their extensive duties and limited staff prevented most from participating in nutrition education activities for students or training for themselves. Only [illegible] percent were involved in nutrition education and [illegible] percent had been to no training programs. Those who had participated in training had attended virtually every program offered (quantity food preparation, safety, sanitation, etc.) This training had been provided either by the local supervisor or ESSB staff.

While only four managers (11 percent) had participated in Nutrition Mission, ten (28 percent) had participated in [illegible] Week and 17 ([illegible] percent) had participated in National School Lunch Week. Only seven ([illegible] percent) had no contact with teachers and other non-kitchen staff. One area showing marked improvement over 1980 was support. Nearly three-fourths of all managers (72 percent) believed they received strong support for nutrition education from principals; another 24 percent saw moderate support. Table 11 summarizes the levels of support managers perceived. Perceived support from principals, parents, students, and the community has gone up, while perceptions about teacher support have remained the same.

Table 11

Perceptions of Food Service Managers Regarding Levels of Support for Nutrition Education They Receive From Various Groups
(Entries are percentages)

Group	Strong Support		Moderate Support		No Support	
	1986	1980	1986	1980	1986	1980
Principals	72	67	24	23	4	10
Teachers	41	75	52	18	7	7
Students	33	10	46	29	21	61
Parents	10	7	38	32	52	61
Community	6	0	24	25	70	75

Teachers. The typical teacher had participated in eight or nine different nutrition activities and taught home economics. Their involvement seemed fairly noninclusive; most (84 percent) had never coordinated activities with food service personnel. The major problems they encountered were lack of time (18 percent) followed by lack of knowledge about available materials (12 percent) and lack of money for materials (12 percent). Their most frequent source of nutrition was newspapers (63 percent), followed by radio and television (43 percent) and popular magazines (38 percent).

Most teachers (62 percent) had had no training in nutrition. Of those who had had training, the most frequent was a basic course in college (40 percent). Of those who had not had any training, 16 (38 percent) indicated that nutrition was not relevant to their subject and eight (20 percent) said none was available. When asked if they would be willing to be trained to provide nutrition education and act as a resource person, most (53 percent) said no, 43 percent said yes, and four percent were undecided. That 43 percent would agree is a fairly encouraging finding.

Food service workers. Most workers (54 percent) were veterans of seven or more years in food service, usually in the same school or system. Most (64 percent) were not involved in nutrition education and [illegible] percent never received training. For those who had participated in training, sanitation was most frequently cited, followed by portion control and safety. Cooperative activities with teachers may be summarized as follows:

• Nutrition Mission	8 percent
• School Breakfast Week	10 percent
• School Lunch Week	11 percent
• Other	7 percent

Most seemed willing to work in one way or another with teachers to help students learn about nutrition. Many had already participated in such activities as tasting parties (23 percent), tours (18 percent), and special event days (15 percent). Larger numbers indicated willingness to try these activities.

As with managers, food service workers' perceptions of support for nutrition education seemed much improved since 1980. Over 80 percent perceived strong or moderate support from principals and 66 percent saw similar support from teachers. Table 12 summarizes their views.

Summary. Questionnaire results show that at least two recommendations voiced previously have clearly been met (Recommendations 9 and 10 of Table 4, page 15) and that at least two others may have been met (Recommendations 5 and 6). School food service personnel perceive much more support than they saw in 1980 and are more involved with other school staff in providing nutrition education. Yet most teachers do not interact with food service personnel and most food service personnel do not interact with teachers. Principals do not seem to be directly or extensively involved in planning, monitoring, or evaluating nutrition education activities, yet many would welcome the opportunity. While the questionnaire results are encouraging in many ways (increased support, increased willingness to help teach

Table 12
Perceptions of Food Service Workers Regarding Levels of Support for Nutrition Education They Receive From Various Groups
(Entries are percentages)

Group	Strong Support		Moderate Support		No Support	
	1986	1980	1986	1980	1986	1980
Principals	50	49	34	20	16	31
Teachers	20	14	46	29	34	57
Students	11	8	58	39	31	53
Parents	3	9	53	17	44	74
Community	3	3	35	19	62	78

students about nutrition), they also reflect much untapped potential and several missed opportunities.

Site Visits

The site visits offered an opportunity to explore some of the questions raised by other procedures. One major finding was that the selection of nutrition liaison is absolutely crucial to the success of nutrition education and is a matter over which ESSN staff have been given little or no control. For example, in LEAs where the liaison was a supervisor of a secondary subject (home economics, science), activity in elementary schools was limited. Where the liaison was food service supervisor, activity in the classroom was limited because of limited contact between food service personnel and teachers. Finally, the personal characteristics, networks, and interpersonal skills of the liaison were often the deciding factor in the implementation of a particular program.

In small LEAs, liaisons have broad responsibilities and limited resources. Often the responsibilities conflict. For example, in one LEA a grand jury had mandated drug education in the schools. The health supervisor was directed to find and implement a program immediately. This left little or no time for coordination of nutrition activities.

In large LEAs the weight of the bureaucracy is often too great an obstacle to coordination efforts. Food service personnel have one line of authority; teachers have another. Indeed, elementary and secondary, health and social studies, science and home economics exist in separate worlds. Truly interdisciplinary programs are exceedingly difficult to effect in large LEAs. Yet, they do exist. One very good program was found in a large LEA where an instructional supervisor and a food service supervisor had pooled their considerable individual talents to improve access of teachers and food service managers to one another and to a wide variety of programs. Materials and programs developed by the ESSB constituted but a portion of this pool.

Other excellent materials are available from Pillsbury, the American Heart Association, the National Dairy Council, Florida Citrus Commission, food companies, and drug companies, and are in widespread use. In many instances, the ESSB actually reviews, evaluates, purchases, and makes available many of these materials. In this manner, ESSB can promote the most appropriate materials and address any voids or gaps with materials they develop.

Particularly in small LEAs, the materials and programs were a welcome supplement to limited resources. Nutrition Mission and various food service courses had been implemented and well received in most of the LEAs visited. Food service workers in most LEAs and schools had participated in Prep Talks. Other materials and programs noted included the following:

Serve Safe, Serve Smart (Course)
Menu Mastery (Course)
Nutrition for the Health of It (Activities)
Food and Nutrition Bulletin
Salute to School Food Service (Recognition)
School Breakfast Week in Maryland (Annual Event)

Use of the Resource Lending System Directory of Media Materials and other resources was less obvious.

Liaisons, teachers, principals, food service personnel offered candid evaluations of ESSB support, coordination, and materials. Those who had seen state developed programs were generally enthusiastic about them, particularly Nutrition Mission. Workshops and inservice training were also much appreciated. ESSB staff were seen as responsive and well informed. Many liaisons and others expressed the sentiment that they could call on ESSB staff for help and get it.

Summary. Site visits confirmed many of the tentative conclusions precipitated by NAI and questionnaire findings. Nutrition education may or may not be stressed in a particular LEA, depending on other local goals. Materials are being selected by teachers and others who have little training in nutrition and limited basis for selection other than awareness and availability. As more and more teachers complete Nutrition Mission inservice training, it is likely that they will become more selective concerning these materials. Local support for nutrition education is improved over previous years.

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

The previous chapter provided a detailed assessment of nutrition education in Maryland from four points of view. These are summarized below.

- Materials Development--the ESSB has developed excellent materials, responsive to specific needs identified in 1980, and appropriate to the audiences for which they are intended.
- Nutrition Assessment Inventory--elementary school students show little improvement since 1980, while junior and senior high students show improvement. These two groups also demonstrated declines in some areas.
- Questionnaires--while interaction between teachers and food service personnel was still rather limited, more people have received training, more would like training, and support for nutrition education is improved over 1980 levels.
- Site Visits--unless the liaison is strongly committed to nutrition education, it cannot succeed. Local politics, limited interaction, and competing priorities were the main obstacles to effective nutrition education.

The purpose of this chapter is to explore the reasons for these findings and to offer concrete recommendations for improvement in Maryland's nutrition education and training.

Conclusions

In many respects the ESSB has done a great deal with finite resources. Staff have developed excellent materials and programs, have made themselves available to local educators and food service personnel, and have provided timely and effective training. The primary limitation to such activity is the fact that ESSB's ability to initiate training efforts at the local level is limited by budget constraints and other factors. For example, there has never been a statewide meeting with all 24 local nutrition liaisons in attendance because while the ESSB can convene such a meeting, they cannot require attendance.

Once contact is made, other local priorities often present a major roadblock. Again state staff have little or no control. If teachers and food service personnel do not interact, if science and health and home economics teachers do not interact, if nutrition resource persons and elementary teachers do not interact, there is little the ESSB can do to bring about effective nutrition education.

Nutrition Mission, School Breakfast Week, Eating Breakfast, the *Food and Nutrition Bulletin*, the Directory of Media Materials, and *Someone is in the Cafeteria* all address the need for interaction. Nutrition Mission and some other programs are widely used. Others are not. Predictably, where programs are in place, interaction is more apparent.

Finally, the personality, authority, and interests of the liaison are critical factors in the success of a nutrition education and training program. It is apparent that most liaisons lack proper authority to implement a genuine K-12 program that includes all school staff. Food service supervisors have little access to curriculum; curriculum supervisors have no control over food service. Some liaisons possess personal traits and cross-disciplinary alliances that allow them to be more effective than their titles suggest. Most do not.

For all the reasons given above, one can conclude that staff of the Educational Support Services Branch have performed well, under the circumstances. Further effectiveness may well depend on altering some of the circumstances.

Recommendations

The following six recommendations focus almost entirely on expanding the use of the materials and programs developed by the ESSB. The reason for this focus is that sufficient emphasis has been placed on materials development and that good materials now exist.

Recommendation 1: Establish criteria and specific responsibilities for nutrition education liaisons.

As noted above, most liaisons lack the authority to carry out an interdisciplinary program. While the ESSB cannot and should not appoint these individuals, they can offer guidance to those who do select them. Suggested criteria include:

- Access to all program areas at all grade levels
- Authority to monitor and evaluate programs and staff
- Sufficient tenure in the local education agency to assure knowledge of other programs and personnel
- Expressed interest in nutrition education and potential for continued education role

Selection by job title should be discouraged. A food service supervisor is not an inherently better liaison than an elementary supervisor.

At the same time, persons with other responsibilities should not be designated nutrition liaison without some release from other duties. Responsibilities of liaisons will include promotion of nutrition education, contact with ESSB, implementation assistance, and evaluation. This last responsibility is crucial. It is insufficient to say, "I think we tried that a couple of years ago but I'm not sure how it went."

Liaisons need to recognize the fact that not every program is appropriate for every school. Implementation, evaluation, and improvement need to be ongoing.

Recommendation 2: Work with staff where contact is now strong to expand use of ESSB-developed materials.

While access to school staff varies across LEAs, it also varies within LEAs. In those LEAs where some teachers and food service personnel have shown strong interest, ESSB staff and liaisons need to capitalize on this interest and provide ways these local staff can share their experiences with others. Some staff interviewed during site visits used ESSB nutrition materials extensively and were not aware that others did not. Such individuals need to be made aware of their uniqueness and encouraged to tell others about the programs.

Recommendation 3: Continue and expand *Nutrition Mission*

First, this recommendation does not in any way suggest that any other programs should not be continued or even expanded. Rather, Nutrition Mission is such a good program, so well received, that it should be considered for continuation and expansion before any other program. Local school staff may now contact ESSB for additional sets of materials. While ESSB staff currently respond well to such requests, they may wish to be more proactive, perhaps by conducting an informal needs assessment to determine how many more sets of Nutrition Mission materials they should make available and then set about to distribute them systematically.

Recommendation 4: Expand promotional efforts through such vehicles as the *Food and Nutrition Bulletin* and Salute to School Food Service Personnel.

The *Food and Nutrition Bulletin* reaches a wide audience. Programs such as School Breakfast Week and *Nutrition for the Health of It* are described. Given the audience, content could include case studies and success stories--how a particular program was used in one school and how it worked, teachers telling other teachers and food service personnel telling other food service personnel how effective they thought a program had been.

In Salute to School Food Service Personnel, the focus is on people who plan and prepare meals. This is no time for nutrition education to sit quietly. Rather, liaisons should use the opportunity and its inherent publicity to promote specific nutrition education activities. Then they need to follow up the interest generated during Salute to School Food Service Personnel to make sure it does not quickly fade.

Recommendation 5: Identify individuals who show unusual enthusiasm for nutrition education and provide them opportunities to expand their role in nutrition education

Frequently in any educational program someone will unexpectedly become zealous. Liaisons and ESSB staff should find ways those people can continue their involvement in a program and carry that program to others. This phenomenon is already occurring with materials developed by the Heart Association, food companies, and various councils and commissions. Teachers, food service workers and others have found nutrition education materials that have struck a nerve (a child with diabetes, a parent with a heart condition, perhaps) and have fervently promoted those materials. Similar occurrences can be expected with ESSB-developed materials. The ESSB should be prepared to respond promptly and thoughtfully to these individuals, to cultivate their enthusiasm, and to provide guidance and assistance.

Recommendation 6: ESSB staff should work closely with counterparts in other divisions of the MSDE to assure that reliable nutrition information is disseminated to teachers and others involved in nutrition education.

The site visits revealed that the ESSB is not the only source of nutrition information within the MSDE. LEA science coordinators receive nutrition information from the MSDE science supervisor. LEA health supervisors receive nutrition information from the MSDE health supervisor. LEA home economics supervisors receive nutrition information from the MSDE home economics supervisor. What kind of information are they receiving? What is its content, quality, accuracy, relevance? Classroom teachers are obtaining nutrition information from literally hundreds of sources. Some of these have been named. What are the others? How good are they? How appropriate are they?

ESSB staff can provide two services to and through other divisions. First they can make sure duplication of effort is minimized. While it is not likely that the MSDE home economics supervisor has a program exactly like Nutrition Mission, she probably has obtained or developed materials similar to some of those disseminated by the ESSB. Furthermore, she no doubt has access to excellent materials on teen pregnancy, eating disorders, and similar topics. ESSB staff need to be aware of these materials. While we do not advocate turning the ESSB into a materials clearing house, we do suggest that all MSDE personnel dealing in a significant way with the issue of nutrition speak with a single voice as much as possible. Interdivisional cooperation is a critical first step toward that goal.

Second, ESSB staff need to note the nutrition information resources used by teachers. Some of these resources have been reviewed by objective nutrition experts. Others need to be reviewed. By obtaining as many reviews as possible and supplying them to state level supervisors, ESSB staff can perform a much needed service. It would be of interest to the MSDE health supervisor for example, that many teachers are employing articles from a subtly biased, self-promoting trade journal and that the articles have been found by nutrition experts to be misleading.

Both of these approaches involve spending time outside the ESSB and shifting focus from materials to relationships. While some of these contacts have already been made, this recommendation emphasizes the systematic development and sustainment of such alliances.

Summary

Nutrition education in Maryland has reached a major milestone. Staff of the Educational Support Services Branch have responded positively and energetically to the 1980 needs assessment and have produced quality nutrition education materials. At the same time they have begun to develop a mechanism whereby those materials might be disseminated to 24 local education agencies for the benefit of Maryland students. Now the time has come to commit renewed vigor to the task of perfecting the delivery mechanism and monitoring the results. If that task is approached as capably as the previous task was approached, then the outcome should be just as positive.

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APPENDIX

REVIEW OF NUTRITION EDUCATION MATERIALS DEVELOPED BY THE EDUCATIONAL SUPPORT SERVICES BRANCH OF THE MARYLAND STATE DEPARTMENT OF EDUCATION

Activity Packet-*School Breakfast Week in Maryland*

Overview

School Breakfast Week in Maryland is an activity packet developed each year since celebration of School Breakfast Week in Maryland began in1981. For example, the 1984 theme was "Program Your Day-Input Breakfast" and the activity handbook presented 46 pages of a variety of nutrition education breakfast promotion activities. In addition, a list of nutrition liaison representatives with phone numbers was included as well as list of computer assisted nutrition education programs. Press releases were part of the packet. The 1986 theme is "Up, Up, and On Your Way With Breakfast." Activity packets have been prepared for the elementary level and the secondary level. Posters, stickers, brochures,and press releases, are included.

Recommendations Addressed

There should be a heavy emphasis on the development and/or selection of nutrient-related materials in classroom instruction particularly at the early elementary grades. E*[1]

Steps should be taken to motivate older students to eat breakfast and lunch more frequently and to eat more balanced meals. E*

The training of teachers to work in nutrition education must emphasize the need for cooperation as well as methods for working cooperatively. E*

Emphasis should be placed on how to obtain the assistance of food service personnel in nutrition education and training. E*

Teachers should receive from FNB[2] and other sources assistance in finding appropriate materials to use in nutrition education. VD*

Materials and procedures must take into account the levels of education and prior experience of teachers as well as those of food service personnel. VD*

Food service managers need more interaction with teachers and students than they presently have. E*

Day care workers need additional assistance in menu writing. VD*

Overall Evaluation

Activity packets to celebrate School Breakfast Week prepared on an annual basis are sent to each child nutrition program in the state. The packets are very well done presenting a wide variety of activities appropriate for various age levels and

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[1] *E and VD refer to designations of recommendations provided in the 1980 needs assessment. E denotes Essential while VD means Very Desirable

[2] FNB, Food and Nutrition Branch, has evolved into the Educational Support Services Branch (ESSB)

appropriate for teachers or food service managers to implement. The breakfast activity packets can provide an important link between teachers and managers.

The breakfast week activity packets meet five Essential recommendations and three Very Desirable recommendations.

Courses for Food Service Personnel

Overview

These courses have been designed to improve the knowledge and skills of food service personnel. The following courses have been developed in response to needs of food service workers and managers throughout the state.

1) *Prepare With Pride*

2) *Menu Mastery*

3) *Serve Safe-Serve Smart*

4) *SuperVision* (currently under revision)

5) *Speak Easy*

The courses are developed and field tested in cooperation with a committee of LEAs. The course is then revised, packaged and distributed to the LEAs for them to use at their discretion.

Prepare With Pride

This quantity food preparation course has as its primary goal, "to improve the quality, acceptability, and nutritive value of meals served under the Child Nutrition Program by improving the skills and increasing the knowledge of food service employees." It provides the necessary training in food preparation and related areas with specific competencies to be achieved in food processing knowledge, skills, and attitudes.

Twenty-two audiovisual aids accompany the nine-day course and include video tapes developed by ESSB, slide tape sets, and films. The course includes meal production, labs, recipes, equipment use and care, and nutrition information. Various instructional strategies are used to assure development of specified competencies. Food service personnel who complete this course should have raised their level of food processing skill significantly as well as developed a very positive attitude toward food production for school meals.

Menu Mastery

This is a five-day, three-part course to enable food service managers to plan well-balanced, cost-effective menus acceptable to students and to develop optimal receiving and storing procedures. Part I teaches the multiple factors involved in menu planning; Part II addresses purchasing, and Part III addresses receiving and storage.

Included in the course are films, games, drills, reading and reporting activities, group and individual exercises, lectures, and discussions. Examples of audiovisual teaching aids include transparencies, 113 slides, and *Home and Garden Bulletin* No. 232. A set of teaching and audiovisual aids can be borrowed from the ESSB media center. The package contains a set of NASCO food models, two 16mm films, one videocassette, one food service training program on the care and handling of fresh produce, one slide-tape presentation *Dietary Guidelines*, one slide set

A Winning Combination, and five copies of *Purchasing Pointers for School Food Service*. Each kit also contains one copy of the Menu Planning Guide for School Food Service and the Food Buying Guide for the Child Nutrition Program.

Participants should be well prepared at the completion of the course to plan menues that maximize nutrient content, acceptance by students, and cost effeciency. Menu planning is approached in novel ways, including salad bars.

Serve Safe-Serve Smart
This three-day course is designed primarily to teach food service employees how to handle food in a safe and sanitary manner. It includes extensive participant materials as well as overhead transparencies, a list of materials needed, and reference to the many audiovisual aids and instructional materials that accompany the course. Examples include "Kitchen Sanitation Rules" (a slide-tape presentation), "Dishing It Out" (filmstrip), "Machine Dishwashing" (slide show), and "Protecting the Public" (slide show).

Section I addresses the importance of temperature control and the relationship between food temperature and control of bacterial growth. Participants learn, through hands-on experience, techniques to speed food through the temperature danger zone.

Section II, a safety and sanitation manual, emphasizes further sanitary food handling procedures. Methods and techniques for sanitizing contact surfaces, for avoiding cross contamination, and for protecting prepared and ready-to-serve food from bacteria are throroughly covered. This section also covers portion control and offer vs. serve.

SuperVision
This course is intended to teach management concepts, supervisory skills, and communication techniques. It was under revision and not available for review.

Speak Easy
This course was under development for 1987 field testing at the time of the review. It too was unavailable for review.

Recommendations Addressed

- Food service workers should receive incentives for participating in nutrition education. E*

- Food service managers should receive incentives for participating in nutrition education. E*

- Serious consideration needs to be given to the development of an incentive program for food service workers to participate in training, particularly training related to nutrition education. E*

- Food service workers have expressed an interest in more on-the-job training. VD*

Overall Evaluation

The courses for food service personnel are well-planned, well-developed workshops with complete outlines of objectives, activities, and evaluation strategies.

An instructor's manual contains the detailed program. Handouts and audio-visuals are included in the kit for each course. The courses are outstanding examples of relevant inservice education made available to the LEAs by MSDE. Each course provides incentives for participation; e.g., buttons, certification credit, and potential for job advancement.

The courses for food service personnel meet one Essential recommendation and one Very Desirable recommendation.

Eating Breakfast-Your Mission for Good Nutrition

Overview

Eating Breakfast-Your Mission for Good Nutrition is a nutrition education pamphlet provided to school food service offices for instruction, for cafeteria staff to send home, or to use with students. The content is written to appeal to the parents of young children or to address older students themselves.

Recommendations Addressed

Steps should be taken to motivate older students to eat breakfast and lunch more frequently and to eat more balanced meals. E*

Food service managers need more interaction with teachers and students than they presently have. E*

Principals should be made aware of how nutrition education and training works. VD*

It is necessary that the role of parents in the nutrition education process be defined for them. VD*

Overall Evaluation

The *Eating Breakfast* pamphlet specifically addresses parents, but the pamphlet is also useful for older students, principals, and the public. The pamphlet is attractive and easy to read.

Eating Breakfast meets two Essential recommendations and two Very Desirable recommendations.

Exploring Foods Workbook

Overview

Exploring Foods Workbook is for children ages 2-5. The activities are designed to help children learn about foods, where they come from, and how to enjoy food. The day care setting becomes an influential experience for young children to develop positive attitudes about foods and eating.

Recommendations Addressed

There should be a heavy emphasis on the development and/or selection of nutrient-related materials in classroom instruction particularly at the early elementary grades. E*

Teachers should receive from FNB and other sources assistance in finding appropriate materials to use in nutrition education. VD*

Teachers and other personnel on the various nutrition projects should receive from FNB and local media specialists some assistance in educational media. VD*

For programs that have multiple sites, such as Head Start, resource linkers are needed. VD*

Overall Evaluation

Exploring Foods Workbook is an excellent resource of activities for the pre-school child that could be used by day-care workers, kindergarten teachers, or parents to facilitate development of good eating habits.

Exploring Foods Workbook meets one Essential recommendation and three Very esirable recommendations.

Food and Nutrition Bulletin

Overview

The *Food and Nutrition Bulletin* is mailed quarterly to all food service supervisors and nutrition liaisons from FNB of the MSDE. The newsletter provides pertinent information for operation of child nutrition programs as well as being a vehicle for recognition of food service personnel. Nutrition education programs are promoted and results of various activities at individual schools are shared. Feature articles address important events or topics to help generate enthusiasm among food service personnel and to encourage cooperation with teachers and principals in implementing nutrition education activities.

Recommendations Addressed

Emphasis should be placed on how to obtain the assistance of food service personnel in nutrition education and training. E*

Food service managers should receive incentives for participating in nutrition education. E*

Serious consideration needs to be given to the development of an incentive program for food service workers to participate in training, particularly training related to nutrition education. E*

Food service workers perceive that teachers and students give almost no support to them. A major need for food service workers is the correction of this perception. E*

Principals should be made aware of how nutrition education and training works. VD*

Overall Evaluation

Food and Nutrition Bulletin is a quarterly newsletter that not only disseminates necessary information but provides publicity for appreciation and recognition of projects for food service personnel such as "Salute to School Food Service Personnel." Teachers might benefit from an occasional "special edition" of the Bulletin.

Food and Nutrition Bulletin meets four Essential recommendations and one Very Desirable recommendation

Nutrition for the Health of It

Overview

Nutrition for the Health of It is a compilation of suitable nutrition education instructional activities for home economics classes. The wide variety of topics and activities reflect current concerns about foods and nutrition which can be adapted for individual classroom needs. Activities are categorized and referenced by topic. Topics include personal food habits, fast foods, snacks, convenience foods, application of the basic four, nutrients in foods, calories and energy balance, athletes and nutrition, anorexia and bulimia, food fads and myths. A supplemental resource is included. The packet is not intended to be a curriculum guide. Nutrition for the Health of It has been sent to every home economics department in the state.

Recommendations Addressed

There should be a heavy emphasis on the development and/or selection of nutrient-related materials in classroom instruction particularly at the early elementary grades. E*Steps should be taken to motivate older students to eat breakfast and lunch more frequently and to eat more balanced meals. E*

Instructional emphasis should be placed on advertising, food preparation and distribution, and food labeling. VD*

Teachers should receive from FNB and other sources assistance in finding appropriate materials to use in nutrition education. VD*

Materials and procedures must take into account the levels of education and prior experience of teachers as well as those of food service personnel. VD*

Teachers and other personnel on the various nutrition projects should receive from FNB and local media specialists some assistance in educational media. VD*

Overall Evaluation

Nutrition for the Health of It is an excellent resource for home economics teachers to use in implementing nutrition activities in the home economics classroom. The wide variety of activities and media provided in the manual should respond to almost any individual classroom need.

Nutrition for the Health of It meets two Essential recommendations and four Very Desirable recommendations.

Nutrition Mission and Supplementary Materials

Overview

Nutrition Mission is a three-hour inservice program for elementary school teachers on nutrition education strategies. It includes a series of four video training programs: (1) Eating for Health, (2) Nourishing, (3) Choosing Wisely, (4) Building Consumer Skills. The video programs demonstrate effective nutrition education methods as well as highlight current nutrition information.

The video series is accompanied by a participant manual which presents classroom applications including lunchroom activities such as "have the class eat breakfast together," "examine a school lunch menu for a week for nutrient content," plan a tasting party--invite your cafeteria manager." Many of the suggested activities include ways to obtain the assistance of food service personnel in nutrition education.

The two major purposes of the series are:

(1) To increase teachers' awareness of the health and behavioral effects of food intake and eating patterns

(2) To assist teachers in applying nutrition concepts to their curriculum and to demonstrate methods for doing so.

A *Nutrition Mission* Activities Kit is given to those who have attended an inservice program on Nutrition Mission and plan to implement what they have learned through lesson plans and classroom instruction. The kit was developed to provide positive reinforcement for classroom and cafeteria activities. The kit includes iron-on patches, all-weather strips, stickers, buttons, stamps, stationary, and activity sheets. The items are available through cafeteria managers who obtain them through their supervisors.

Letters to parents, a press release, and a mug for the cafeteria manager to give to the school principal are included in the principal's press kit.

Recommendations Addressed

There should be a heavy emphasis on the development and/or selection of nutrient-related materials in classroom instruction particularly at the early elementary grades. E*

Instructional emphasis should be placed on advertising, food preparation and distribution, and food labeling. VD*

The training of teachers to work in nutrition education must emphasize the need for cooperation as well as methods for working cooperatively. E*

Emphasis should be placed on how to obtain the assistance of food service personnel in nutrition education and training. E*

Teachers should receive from FNB and other sources assistance in finding appropriate materials to use in nutrition education. VD*

Materials and procedures must take into account the levels of education and prior experience of teachers as well as those of food service personnel. VD*

Teachers and other personnel on the various nutrition projects should receive from FNB and local media specialists some assistance in educational media. VD*

Food service managers need more interaction with teachers and students than they presently have. E*

The perception that food service managers receive little or no support from teachers or students must be changed either through improving the support that teachers and students give to the food service managers or by improving the food service manager's perception of teachers and students. VD*

Food service workers perceive that teachers and students give almost no support to them. A major need for food service workers is the correction of this perception. E*

Principals should be made aware of how nutrition education and training works. VD*

Overall Evaluation

Nutrition Mission is an exceptional resource package for elementary school teachers. The videotapes are appealing and well done, having utilized a popular TV personality, John Burstein (also known as the popular character, Slim Goodbody). The guide is easy for teachers to use, with interesting classroom applications provided. The activity kit is an excellent stimulus for the cafeteria manager to become involved and visible. *Nutrition Mission* meets five Essential recommendations and six Very Desirable recommendations.

Supplementary Materials

Following is a list of nutrition education materials for countywide inservice of *Nutrition Mission*. Materials given are based on needs and ages of students receiving nutrition education. Schools and LEAs do not receive all of the above materials but a specified dollar amount.

Audiovisuals

1. *Cheeseburger, This Is Your Life*
2. *Slim Goodbody - Digestion & Respiration*
3. *The Snacking Mouse* ____ *The Snacking Mouse Goes To School*
4. *Winnie the Pooh, Nutrition & You*
5. *Nutrition Around The Clock*
6. *The Young & The Nutritious*
7. *321 Contact: Food & Fuel*

Books

1. *Apricots, Bagels, Clever Cooks & Other Stories About Nutrition*
2. *No Nonsense Nutrition for Kids*
3. *Exploring Foods Workbook*
4. *Choose Well Be Well Curriculum Guide* - Primary Grades & Upper Elementary Grades
5. *Nutrition in a Changing World Curriculum Guide* - Grade 1-3, Grade 4, Grade 5

Prep Talks and Related MSDE-Sponsored Inservice

Overview

The following inservice training activities, called Prep Talks, for food service personnel staff development, are part of a series of activities to improve knowledge, skills, and awareness levels about school food service and child nutrition programs:

1) Prep Talk--Speak Out On Child Nutrition - 1986
2) Food Service Skills for the Child Care Food Program - 1985*
3) Food Service Skills For Employees of Nonprofit Private School and Residential Child Care Institutions - 1985*
4) Regional Workshop for Nonpublic Schools and Residential Child Care Institution Sponsors--Focus on Food Buying Guide and Menu Planning for School Food Service - 1985*
5) Prep Talk--Calorie Connection - 1985
6) Prep Talk--A Winning Combination--Menu Planning and Food Buying Guide - 1984
7) Regional Workshop for Child Care Food Program Sponsors--Focus on Food Buying Guide - 1984*
8) Supervisory Training Workshop - 1984*
9) Inservice Training Workshop for Food Service Supervisors - 1983*
10) Menu Magic - 1983*
11) Food Service Supervisory Conference - 1983*
12) Prep Talk--Know Your Audience - 1983
13) Supervisory Training Workshop - 1982*
14) Prep Talk - 1982
15) Supervisory Training Workshop - 1981*

The Prep Talk series of inservice programs is made up of carefully planned programs of 1 to 2 hours. Each year Prep Talks are announced to the various schools via a memo from MSDE. The programs include objectives, activities, and evaluation for the topic presented. Recent Prep Talks include overheads, slides, or videos.

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* Related MSDE sponsored inservice; approved activities for inservice training of groups other than food service managers (e.g., LEA food service supervisor/directors, child care program directors, cooks, nonpublic school and residential child care institution food service personnel)

Manuals, *Menu Planning Guide for School Food Service*, and *Food Buying for Child Nutrition Programs*, accompany corresponding Prep Talks. Certificates, buttons certification credit, and potential job advancement are incentives for food service personnel to attend Prep Talks training.

Recommendations Addressed

Food service managers should receive incentives for participating in workshops and other training activities. E*

Food service managers need more training in nutrition education. VD*

Serious consideration needs to be given to the development of an incentive program for food service workers to participate in training, particularly training related to nutrition education. E*

Food service workers have expressed an interest in more on-the-job training. VD*

Day care workers need additional assistance in menu writing. VD*

Overall Evaluation

Prep Talks, activities and materials, are sound training programs for food service personnel presented annually to school food service managers and workers who request the presentations. Material such as the manuals, slides, and videos are exceptionally well-done and definitely enhance the program. It is obvious that a serious effort is made to design the programs at an appropriate educational level.

Prep Talks meets two Essential recommendation and three Very Desirable recommendations.

Resource Lending System-Directory of Media Materials

Overview

A lending system for resource materials was instituted in 1983 to provide nutrition education and food service training materials to all schools, institutions, and child care facilities participating in any child nutrition programs. The Directory of Media Materials, which is updated annually, is mailed to all nutrition liaisons, child care centers and food service supervisors each year. Materials are available for loan on a first come first served basis. Materials are mailed from MSDE or they can be picked up at the MSDE Educational Support Service Branch office.

Recommendations Met

Emphasis should be placed on how to obtain the assistance of food service personnel in nutrition education and training. E*

Teachers should receive from FNB and other sources assistance in finding appropriate materials to use in nutrition education. VD*

Teachers and other personnel on the various nutrition projects should receive from FNB and local media specialists some assistance in educational media. VD*

All nutrition education inservice training of food service personnel must emphasize the need for close cooperation with teachers and other staff. E*

For programs that have multiple sites, such as Head Start, resource linkers are needed. VD*

Overall Evaluation

The Directory of Media Materials includes a wide variety of nutrition education and food service training resources, such as booklets, books, curriculum guides, computer programs. film loops, films, games, filmstrips, food and nutrition teacher guides, puppets , transparencies, slide sets, and videocassettes. The collection is impressive and comprehensive and should provide excellent supplementation to meet almost all the recommendations if used by teachers and food service supervisors.

The Directory of Media Materials meets two Essential recommendations and three Very Desirable recommendations.

Salute to School Food Service Personnel

Overview

Salute to School Food Service Personnel was implemented to assist LEAs in showinf their appreciation to food service personnel. The occasion was the 40th Anniversary of the National School Lunch Program. School superintendents were encouraged to plan a local recognition of school food service personnel.

Recommendations Addressed

The perceptions that food service managers receive little or no support from teachers or students must be change either through improving the support that teachers and students give to the food service managers or by improving the food service manager's perception of teachers and students. VD*

Serious consideration needs to be given to the development of an incentive program for food service workers to participate in training, particularly training related to nutrition education. E*

Food service workers perceive that teachers and students give almost no support to them. A major need for food service workers is the correction of this perception. E*

Principals should be made aware of how nutrition education and training works. VD*

Overall Evaluation

Salute to Food Service Personnel is a good appreciation and recognition project. An annual event such this could change the visibility and status of food service personnel in the eyes of principals, teachers, and students.

Salute to Food Service Personnel meets two Essential recommendations and two Very Desirable recommendations.

School Meals: A Winning Combination

Overview

A Winning Combination is a simple brochure that accompanies a five by eight foot display board promoting school meals. It is directed at parents and the larger community, intended for use at PTA meetings, conventions, health fairs, shopping mall displays and other public information opportunities. It is also suggested for use with older students. MSDE lends the display board to local food service association chapters for these purposes.

Recommendations Addressed

Steps should be taken to motivate older students to eat breakfast and lunch more frequently and to eat more balanced meals. E*

Principals should be made aware of how nutrition education and training works. VD*

It is necessary that the role of parents in the nutrition education process be defined for them. VD*

Overall Evaluation

Associated with *School Meals: A Winning Combination* is a 5' x 8' display board which can be used to promote the school lunch and breakfast programs. The brochure and display board graphically depict the theme that children who eat school meals are better nourished and that fewer children skip breakfast in schools which have a breakfast program.

A Winning Combination is an attractive brochure utilizing statistics and graphs to appeal to the older student, parents, and the public. It can be used in a variety of settings.

A Winning Combination meets one Essential recommendation and two Very Desirable recommendations.

Someone Is In The Cafeteria

Overview

Someone Is In The Cafeteria is a nutrition education pamphlet provided to school food service offices and local school food service association chapters to use for public information. The importance of the school lunch program to good nutrition is succinctly presented to parents and/or others.

Recommendations Addressed

Food service managers need more interaction with teachers and students than they presently have. E*

Parents and principals should be made aware of how nutrition education and training works. VD*

It is necessary that the role of parents in the nutrition education process be defined for them. VD*

Overall Evaluation

The pamphlet *Someone Is In The Cafeteria*, is very attractive, in red, white, and blue color with the content appropriate for parents, principals, or the public in general. It is "catchy" enough, yet sophisticated enough, to use with a broad audience and to entice reading.

Someone Is In The Cafeteria meets one Essential recommendation and two Very Desirable recommendations.

Maryland State Department of Education
Office of Administration and Finance
Educational Support Services Branch

Nutrition Education Needs Assessment

Final Report

1986

SUPPLEMENTS

TM 012 002

MARYLAND NUTRITION EDUCATION NEEDS ASSESSMENT

FINAL REPORT
1986

SUPPLEMENTS

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Measurement Incorporated

and

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This study was conducted under a contract from the
Maryland State Department of Education, Educational Support Services Branch;
Program Assistance and Monitoring Section.

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SUPPLEMENT A

SAMPLING PLAN

Nutrition Education Needs Assessment

Sampling Plan

Students to be tested in the Nutrition Education Needs Assessment were identified through a stratified random sampling plan. First, the state was divided into four blocks on the basis of enrollment and per pupil expenditures for school food service programs. An attempt was made to make the four blocks equal in size.

Enrollment figures for 1985-86 were taken from *The Fact Book 1985-1986* (MSDE, undated). From page 7, the figures for elementary (for the grade 4 sample) and secondary (for the grade 8 and grade 11 samples) enrollments were as shown in Table A1.

Table A1
Elementary and Secondary Enrollment and Rank

LEA	Elementary Enrollment	Rank	Secondary Enrollment	Rank
Allegany	4,812	14	6,009	12
Anne Arundel	26,913	5	31,865	5
Baltimore	34,008	4	40,357	4
Calvert	3,527	16	3,851	16
Caroline	1,999	21	1,969	21
Carroll	8,339	9	9,783	9
Cecil	5,231	13	5,939	13
Charles	7,058	11	8,585	10
Dorchester	2,069	20	2,372	18
Frederick	10,514	8	11,344	8
Garrett	2,303	17	2,356	19
Harford	12,122	6	13,313	6
Howard	10,614	7	12,626	7
Kent	1,028	24	1,168	24
Montgomery	37,683	3	47,216	2
Prince George's	43,765	2	52,824	1
Queen Anne's	2,110	19	2,213	20
St. Mary's	4,747	15	5,255	14
Somerset	1,543	23	1,445	23
Talbot	1,669	22	1,718	22
Washington	7,480	10	8,525	11
Wicomico	5,511	12	5,009	15
Worchester	2,248	18	2,412	17
Baltimore City	52,482	1	46,864	3
Total	289,775		325,018	

Per pupil expenditure was derived by summing all federal aid (Section 4 plus Section 11, breakfast, and milk) listed on pages 28-29 of the Fact Book and dividing by total enrollment. The per pupil allocations and ranks are shown in Table A2.

Table A2
Per Pupil Allocation and Rank

LEA	Total Enrollment	Per Pupil Allocation	Rank
Allegany	11,675	$95.74	3
Anne Arundel	63,576	28.49	21
Baltimore	80,730	27.86	22
Calvert	8,138	39.12	16
Caroline	4,321	77.82	6
Carroll	19,693	21.32	23
Cecil	12,133	40.03	15
Charles	16,873	41.10	14
Dorchester	4,960	86.87	4
Frederick	23,790	32.73	19
Garrett	5,133	86.25	5
Harford	27,558	36.73	18
Howard	25,030	15.23	24
Kent	2,378	58.00	8
Montgomery	92,880	29.68	20
Prince George's	103,611	56.00	9
Queen Anne's	4,696	47.42	11
St. Mary's	11,253	52.44	10
Somerset	3,413	118.93	2
Talbot	3,667	47.15	12
Washington	17,566	38.66	17
Wicomico	11,387	44.06	13
Worcester	5,112	69.48	7
Baltimore City	111,987	123.30	1
Total	671,560	$53.95	

The High Per Pupil Allocation group was found by starting with Baltimore City (Rank 1) and adding LEAs until the total enrollment of this group was as close to 335,780 (i.e., half of 671,560) as possible. This procedure was designed to yield two groups (High and Low) of roughly equal size. A similar procedure was employed to yield high and low enrollment groups by grade. Total elementary enrollment was used for the grade 4 sample while total secondary enrollment was used for grades 8 and 11. The rankings were very nearly the same and the groupings were identical. The resultant groupings (enrollment by allocation) are presented in Table A3.

Table A3
Sampling Frame for Grades 4, 8 and 11

		Per Pupil Allocation	
		High	Low
Enrollment	High	Baltimore City Prince George's	Montgomery
	Low	Allegany Calvert Caroline Cecil Charles Dorchester Garrett Kent Queen Anne's St. Mary's Somerset Talbot Wicomico Worcester	Anne Arundel Baltimore Carroll Frederick Harford Howard Washington

Once districts had been stratified into one of the four blocks all schools within every district in the block were identified. Schools were then randomly selected. As each school was selected, the number of fourth, eighth, or eleventh graders was noted. At the point where the total number of students identified exceeded the number desired, selection stopped. The class lists in Tables A4 through A6 show the actual numbers of students identified by school.

Table A4
Grade 4 Sample Class List

LEA	School	Classes	Students
Anne Arundel (02)	Central (1262)	2	46
	Woodside (4112)	2	46
	Gibson Island Country (0190)*	1	10
Subtotal		4	102
Baltimore (03)	Grange (1210)	1	24
	Sandalwood (1527)	1	24
	Glyndon (0407)	1	23
	Norwood (1207)	1	23
	Deep Creek (1525)	1	23
	Holy Family (0192)*	1	15
Subtotal		6	132
Cecil (07)	Thomson Estates (0306)	1	22
Subtotal		1	22
Charles (08)	Walter J. Mitchell (0105)	1	27
Subtotal		1	27
Frederick (10)	New Midway/Woodsboro (1105)	2	40
Subtotal		2	40
Garrett (11)	Friendsville (0202)	1	9
Subtotal		1	9
Howard (13)	Longfellow	2	42
Subtotal		2	42
*Montgomery (15)	South Lake (0564)	1	28
	Rockview (0795)	2	46
	Burtonsville (0302)	2	56
	St. Bernadette (0038)*	1	15
Subtotal		6	143
St. Mary's (18)	White March (0503)	1	18
Subtotal		1	18
Somerset (19)	Marion (0303)	1	6
Subtotal		1	6
Baltimore City (30)	Walter P. Carter (0134)	2	60
	Pimlico (0223)	3	80
	James McHenry (0010)	2	49
	Holy Rosary (0048)*	1	20
Subtotal		8	209
Subtotal Public		29	690
Subtotal Non-Public		4	60
Total		33	750

* indicates non-public school

Table A5
Grade 8 Sample Class List

LEA	School	Classes	Students
Anne Arundel (02)	Severna Park (2043)	4	104
	Calvery Temple Christian Academy (0125)*	1	10
Subtotal		5	114
Baltimore (03)	Owings Mills Jr./Sr. (0452)	5	128
	Our Lady of Victory (0228)*	1	15
Subtotal		6	143
Cecil (07)	Rising Sun (0606)	1	22
Subtotal		1	22
Charles (08)	Milton M. Somers (0104)	1	27
Subtotal		1	27
Frederick (10)	New Market (0914)	2	40
Subtotal		2	40
Garrett (11)	Northern Middle (0511)	1	10
Subtotal		1	10
Howard (13)	Waterloo (0202)	2	41
Subtotal		2	41
Montgomery (15)	Earle B. Wood (0820)	4	130
	Spencerville Jr. Academy (0340)*	1	15
Subtotal		5	145
St. Mary's (18)	Spring Ridge (0101)	1	17
Subtotal		1	17
Somerset (19)	J.M. Tawes Vocational (1302)	1	7
Subtotal		1	7
Baltimore City (30)	Booker T. Washington (0130)	3	82
	Hamilton (0041)	3	82
	St. Rose of Lima (0170)*	1	20
Subtotal		7	184
Subtotal Public		28	690
Subtotal Non-Public		4	60
Total		32	750

* indicates non-public school

Table A6
Grade 11 Sample Class List

LEA	School	Classes	Students
Anne Arundel (02)	Chesapeake (2273)	3	98
	Annapolis Area Christian (0080)*	1	10
Subtotal		4	108
Baltimore (03)	Parkville (0972)	4	133
	St. Paul's School for Girls (0190)*	1	15
Subtotal		5	148
Cecil (07)	Bohemia Manor (0204)	1	21
Subtotal		1	21
Charles (08)	LaPlata (0106)	1	32
Subtotal		1	32
Frederick (10)	Catoctin (1509)	2	41
Subtotal		2	41
Garrett (11)	Northern (0512)	1	8
Subtotal		1	8
Howard (13)	Atholton (0509)	2	46
Subtotal		2	46
Montgomery (15)	Albert Einstein (0789)	3	82
	Paint Branch (0315)	3	81
	Academy of the Holy Cross (0010)*	1	20
Subtotal		7	183
St. Mary's (18)	Chopticon (0303)	1	19
Subtotal		1	19
Somerset (19)	Washington (0102)	1	5
Subtotal		1	5
Baltimore City (30)	Venable (0115)	2	49
	Claremont (0307)	1	19
	Northern	2	56
	Friends School (0810)*	1	15
Subtotal		6	139
Subtotal Public		27	690
Subtotal Non-Public		4	60
Total		31	750

* indicates non-public school

SUPPLEMENT B

QUESTIONNAIRES AND SUPPORTING DOCUMENTS

Dear Principal:

Your school is one of 75 Maryland schools selected to evaluate our nutrition education programs. Enclosed you will find a checklist and several questionnaires, test booklets, answer sheets, and manuals. One questionnaire is for you. Another is for your food service manager. Others are for teachers and food service workers.

The Nutrition Assessment Inventory booklets, answer sheets, and manuals should be distributed to fourth, eighth, or eleventh grade classes, as appropriate. Obviously, not every student in any one of these grades will be tested. Please select one or more classes to take the tests. They require about one class period.

For every class taking the Nutrition Assessment Inventory (NAI) we have also included two adult levels of the NAI, one for a teacher and one for a food service worker. In this manner, we hope to obtain a representative sample of responses.

All test booklets should be returned to your LEA nutrition liaison, whose name appears on the checklist. Answer sheets and questionnaires should be returned to our contrator for analysis. A postage guarantee label is enclosed.

I appreciate your attention to this matter. With your help, we will improve nutrition education for all Maryland students.

Sincerely,

Joan H. Weatherholtz, Chief
Educational Support Services Branch

Enclosures

Principal's Checklist

LEA ______________________________

School ___________________________

Questionnaires

___ Principal ___
___ Teacher ___
___ Food Service Manager ___
___ Food Service Worker ___

Nutrition Assessment Inventory Materials

___ Intermediate Level Booklets (4th Grade) _______
___ Intermediate Level Answer Sheets __________
___ Junior High Level Booklets (8th Grade) ________
___ Junior High Level Answer Sheets __________
___ Senior High Level Booklets (11 Grade) _________
___ Senior High Level Answer Sheets ________
___ Adult Level Booklets ________
___ Adult Level Answer Sheets _______
___ Administration Manuals _______

4th Grade Classes to Be Tested _________
8th Grade Classes to Be Tested _________
11th Grade Classes to Be Tested ________

Please use the prepaid postage label to return all questionnaires and answer sheets to our contractor whose address is shown below:

Dr. Michael B. Bunch
Measurement Incorporated
2402 Reichard Street, Suite B
Durham, North Carolina
27705

Please return test booklets and manuals to the LEA nutrition liaison:

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Maryland Nutrition Education Needs Assessment

Food Service Manager Questionnaire

DIRECTIONS: Please take a few minutes to answer each of the following questions or complete the statements below. When you have completed this questionnaire, place it in the attached envelope. Seal the envelope and return it to your principal.

Background Information

Your Age (Check one.)

1 Under 30
13 30 - 49
18 50 or over

Sex (Check one.)

28 Female
1 Male

Education Level (Check one.)

6 Attended high school but did not graduate
27 Graduated from high school
2 Attended 2-year college or technical school
0 Attended 4-year college or technical school
0 Graduated from 2-year college or technical school
0 Graduated from 4-year college or technical school

Type of school in which you work (Check all that apply.)

16 Elementary
5 Middle
1 Combined Elementary
5 Junior High
14 Senior High
1 Other Special Education
1 Other Summer Vacation

How long have you held your present position?

0 Less than one year
3 One to three years
15 Three to seven years
14 More than seven years

What was your last job before this one?

17 Food Service Worker
___ Other (specify): ______________________

What portion of your time is spend in managerial tasks?

6 0 - 25%
6 26 - 50%
9 51 - 75%
10 76 - 100%

How many full time employees do you have? ___

How many part time employees do you have? ___

How many student helpers do you have? ___

How many months per year do you work in food service? ___

How many hours per week do you work in food service? ___

Briefly describe your responsibilities. ______________________________

What do you like most about your job?______________________________

____

Are you involved in nutrition education?

16 Yes 20 No

13 At School ___ Elsewhere Where? 4 Central Kitchen

2 Another school

___ Commercial firm

1 Community College

Do you prepare your own meals
or are they delivered to you?

27 Prepare ___ Delivered

How do meals come to you?

10 Bulk
1 Preplated, ready to eat
1 Preplated, chilled
1 Preplated, frozen
2 Individual bag or box
1 Other (specify):
Receive ingredients to make our own lunch

Training

1. Did you receive any special training in order to get your present job?

26 Yes 9 No

What kind? 9 College courses
0 Correspondence courses
27 On-the-job training

2. How frequently do you attend training programs?

1 At least once a month
10 Several times a year, on a regular basis
21 Occasionally, not on a regular basis
5 Never

3. In which of the following topics have you received training during the past two years?

20 Quantity food preparation
21 Safety
25 Sanitation
19 Meal Planning
24 Serving - portion control

16 Public relations
15 Merchandising
20 Nutrition
1 Other (specify): Management
1 on-the-job
1 professional cooking under certified chef

4. Where and/or how did you receive this training?

9 Community college
25 Inservice training from local food service supervisor
1 Other (specify): meetings
1 Baltimore Co. Food Service
1 Through our company
1 Penn State Food Service Seminar

13 Inservice from Maryland State Department of Education
6 On my own
3 Have not had training

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5. In which of the following training activities have you participated?

Activity	Yes/No		Was it helpful?		Have you shared what you learned with you staff?	
Community college quantity food preparation course	10	7	10	0	9	0
Prepare With Pride	13	7	12	0	11	0
Other Sanitation/Community College	2	0	2	0	2	0

6.

DIRECTIONS: In column 1, check each of the areas in which you are involved. In column 2, check each of the areas in which you have received training. In column 3, check each of the areas in which you would like to receive training.

Areas	Column 1 Areas In Which You are Involved	Column 2 Areas In Which You Have Had Training	Column 3 Areas in Which You Would Like To Receive Training
Menu planning	18	11	4
Specifications for purchase	16	11	3
Procedures for receiving and storage	28	15	0
Supervising food preparation	23	14	2
Financial management	13	10	3
Procedures for selling meal tickets	27	11	2
Sanitation (supervision)	25	17	2
Specifications for equipment purchase	5	4	5
Supervising use and care of equipment	22	14	2
Facilities layout	7	1	2
Hiring	14	8	0
Employee evaluation	21	11	3
Training of employees	23	10	5
Nutrition education	11	12	5
Scheduling	19	8	1
Preparation for other schools	9	7	1
Non-food service related duties	13	3	0
Other (specify):	0	0	0

7. Who should have responsibility for teaching students about nutrition? Check all that apply.)

11 Science teachers
26 School nutrition specialist
20 County nutrition specialist
31 Home economics teachers
18 Building level food service manager
20 Physical education teacher
30 Parents
15 School nurse
22 County food service personnel
18 County service (e.g., Extension Agent, Dental Health Department or service, etc.)
18 Elementary teachers
22 School food service personnel
19 Preschool teachers
20 Industry group (e.g., American Dairy Council, Florida Citrus Commission)
13 Health Department
0 Other (specify):______________

8. Which of the following media have you used to provide nutrition instruction in your school?

1 Instructional television
4 Firms or filmstrips
1 Video cassettes
1 Audio cassettes
32 Posters
4 Industry instructional materials
19 USDA materials
21 Menu boards
6 County services materials (e.g., extension agent, dental health service)
0 Other materials (specify):______________

9. Have you worked with teachers on any of the following activities? (Check all that apply)

4 Nutrition Mission
10 School Breakfast Week
17 School Lunch Week
4 Other Activities

10. How important is nutrition in relation to your health?

27 Extremely important
8 Important
0 Not very important
0 Not important at all

11. What are the major problems you've had in using nutrition education materials?

3 Materials are not available.
7 Materials are hard to get.
4 I don't know what I need.
11 I don't have the funds to get them.
9 I don't know where to get them.
2 I don't know how to operate audio-visual equipment.
2 Other (specify): Not enough mature posters
4 time/scheduling

12. How important is nutrition in relation to the health of students?

33 Extremely important
2 Important
0 Not very important
0 Not important at all

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13. To what extent do you plan to use new foods for school lunches this year?

9 Less than once a month
4 Once a month
5 Twice a month
2 Three times a month
3 Once a week
0 Twice a week
1 More than twice a week

14. Which of the planning persons or groups should be involved in menu planning? (Check all that apply.)

27 Students
13 Teachers
11 Parents
16 Principal
34 Food service personnel
0 Other (specify):______

15. To increase participation in the school food service program I would: (Check all that apply.)

24 Make the cafetaria more attractive.
24 Serve more foods that the students like.
19 Try new recipes and food preparation techniques.
7 Work with the principal on scheduling lunch periods.
11 Get involved in nutrition education with classroom teachers.
10 Provide nutrition information at the point of sale.
15 Work to improve the attitudes of teachers and administration personnel.
12 Work to improve a merchandising campaign with letters, display boards, etc.
14 Work to improve the cafeteria personnel attitudes and manner on the serving line.
14 Work to improve skills for communicating with students.
8 Work with parents and the community, such as inviting grandparents to participate.
15 Improve the appearance of food trays.
7 Work to change school policy on vending machines and food sales in schools.
4 Change school policy on vending machines and food sales in schools.
14 Offer popular foods, such as salads, sandwiches, tacos, potato bars, etc.
4 Schedule activity periods prior to lunch.
14 Offer free samples.
8 Conduct special promotional events
___ Other (specify):______

16. How frequently do you work with teachers and other non-cafeteria workers?

3 Every week
1 Every month
23 Occasionally
7 Never

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17. In column 1 check each of the activities in which you have taken part; in column 2, check each of the activities you do well; and in column 3, check each activity in which you would be willing to take part.

Activities	Column 1 In Which I Have Participated	Column 2 In Which I Do Well	Column 3 In Which I Would be Willing to Participate
Tours of Facilities	16	3	9
Tasting parties	15	5	9
Classroom presentations	7	2	6
Presentations to the PTA	1	1	6
Presentations to the faculty	2	1	4
Showing films or movies	3	0	6
Poster contests	7	2	8
Placemat contests	3	0	6
Other contests	2	0	4
Special event days	15	7	5

18. Have you had any problems in preparing appetizing and nutritious meals?

3 Yes 26 No

What problems have you had? (Check all that apply.)

4 Limited choices
1 Scheduling
0 Lack of principal support
2 Lack of teacher support
0 Lack of applicable knowledge
2 Lack of staff cooperation
1 Staff lacks applicable knowledge
4 Lack of necessary equipment
5 Lack of funds
13 Lack of time

Support

19. Indicate the level of support for nutrition education you get from each of the persons or groups listed below.

	Strong support	Moderate support	No support
Principal	21	7	1
Teachers	11	14	2
Cafeteria workers	20	9	0
Students	8	11	5
Parents	2	8	11
Community group	1	4	12
School board	12	9	3

20. What problems do you have in coordinating nutrition activities with your cafeteria responsibilities?

27 Lack of time
3 Lack of confidence
5 Lack of knowledge
10 Lack of materials
4 Lack of communication with teachers or others

0 Health or other local regulations
0 Other (specify):____________________

Maryland Nutrition Education Needs Assessment

Food Service Manager Questionnaire

What was your last job before this one?

17 Food Service Worker

___ Other (specify):

1 none
11 domestic
1 cafeteria manager
4 housewife
1 retail
1 insurance rater
1 telephone work
1 aide at elementary school
2 secretary/office
1 waitress

How many full time employees do you have?

0 0
3 2
3 5
1 7
1 12
2 1
7 4
2 6
1 10
1 15

How many part time employees do you have?

5 0
5 2
2 4
1 6
1 10
8 1
2 3
2 5
1 7
1 15

How many student helpers do you have?

25 0
1 1
1 3
1 5

How many months per year do you work in food service?

1 0
1 9-9½
29 10
1 11

How many hours per week do you work in food service?

1	0	1	3
1	7	4	15
1	17½	1	20
1	26.25	1	30
8	35	5	37½
7	40		

Briefly describe your responsibilities.

17	Food Production
27	Records
4	Clean Up
3	Special Events
2	Personnel
19	Cash & ticket handling
23	Ordering
13	Supervising
2	Training
3	Scheduling
3	Menu Planning

What do you like most about your job?

19	Working with children
5	Comfortable atmosphere
2	Everything
3	Cooking
2	Challenge & Responsibility

N = 40

Maryland Nutrition Education Needs Assessment

Principal Questionnaire

DIRECTIONS: Please respond to each of the following statements or questions by checking the appropriate blank or writing your response in the space provided.

Background Information

Your age (Check one.)

0 Under 30
26 30 - 49
14 50 or over

Sex (Check one.)

22 Female
15 Male

School Type (Check one.)

19 Elementary
5 Middle
2 Junior
10 Senior
1 Other K-12
1 7-12

1. Has your school participated in Nutrition Mission? (For elementary principals only) ________
If yes, go to #2. If no, go to #3. Yes 3 No 21

2. With which school food service personnel do you have the most contact?

3 County (or City) Food Service Supervisor or Director
20 School Food Service Manager (in your building)
11 School Food Service Employees (in your building)
1 State Consultants

3. With what other food and nutrition resource persons do you have contact?________________________________

4. Who should have responsibility for teaching students about nutrition? (Check all that apply)

29 Science teachers
10 School nutrition specialist
11 County nutrition specialist
27 Home economics teachers
12 Building level food service manager
24 Physical education teacher
35 Parents
22 School nurse
11 County food service personnel
11 County Services (e.g., Extension Agent, Dental Health, etc.)
29 Elementary teachers
14 School food service personnel
16 Preschool teachers
12 Industry group (e.g., Dairy Council, Florida Citrus Commission)
12 Public health
1 Other (specify): Interested faculty

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5. To your knowledge, which of the following media have been used to provide nutrition instruction in your school?

18 Instructional television
30 Films or filmstrips
18 Video cassettes
9 Audio cassettes
39 Posters
10 Industry instructional materials

17 USDA materials
23 Menu boards
16 County services materials (e.g., extension agent, dental health)
1 Other materials (specify): Local guides
1 Provided by State Educational Support Services Branch
1 Nurse
1 PTA
1 Textbooks
1 Computer Program

6. How important is nutrition in relation to your health?

27 Extremely important
12 Important
2 Not very important
0 Not at all important

7. How important is nutrition in relation to the health of students?

34 Extremely important
5 Important
1 Not very important
0 Not at all important

8. Check each statement that applies:

4 I have established a school nutrition policy.
28 I think it is important for teachers and food service personnel to work together.
27 I encourage students to eat in the cafeteria.
13 I encourage teachers to eat in the cafeteria.
13 I support the school breakfast program.
14 I usually eat lunch in the cafeteria.
32 I have tried to limit sales of candy and soft drinks in my school.
33 I encourage cooperation between food service personnel and teachers.
13 I encourage students to use the cafeteria as a place to learn about nutrition.
20 School groups (such as PTA) sell food items to raise money.
6 Candy and soft drinks are available for students.

9. Would you be willing to work with the teachers and food service personnel to help them coordinate nutrition education activities?

32 Yes
5 No

10. Do you invite school visitors to eat in the cafeteria?

27 Yes
9 No

11. Which of the following conditions exist in your school? (Check all that apply.)

9	Large number of students who do not eat breakfast before coming to school
4	Large number of overweight students
21	Large number of students from low income families
24	Students with poor snacking habits
10	Students with dental problems
22	More plate waste than I think there should be
1	Nutrient deficiencies reported by the school nurse
11	More student sick days reported than I think there should be
0	Large number of underweight students
4	Pregnant students
10	Problems with overall student fitness
5	Large numbers of students who participate in the school breakfast program
24	Large numbers of students who participate in the lunch program
0	Other (specify):______________________________

Maryland Nutrition Education Needs Assessment

Principal Questionnaire

With what other food and nutrition resource persons do you have contact?

16	None
5	supervisor
9	county food service manager
1	General Conference of Seventh-Day Adventist-Health Department
2	employees
2	nurse
1	cafeteria manager
1	central office personnel
1	directors
1	Archdiocese of Baltimore Food Services
4	interested faculty
1	PTA
1	dental hygienist
1	nutrition specialists

N = 63

Maryland Nutrition Education Needs Assessment

Teacher Questionnaire

DIRECTIONS: Please respond to each of the following statements or questions by writing your response in the space provided. When you have completed this questionnaire, place it in the attached envelope. Seal the envelope and return it to your principal.

Background Information

Your Age (Check one.)	Sex (Check one.)	Type of School
10 Under 30	49 Female	19 Elementary
45 30 - 49	14 Male	13 Middle
8 50 or over		6 Junior High
		25 Senior High
		1 K-12 1 K-8

Grade you teach __ Specialty area _________ Years experience___________

1. Which of the following nutrition education activities have you used or could you use in your classes? (Check all that apply.)

Have Used	Could Use	
37	6	Food preparation in class
13	11	Trip to grocery store or farmer's market
8	18	Trip to cafeteria to show students how school meals are prepared
29	8	Tasting parties
25	18	Development or use of commercially prepared games about food and nutrition
42	3	Activities in which students categorize foods in the basic food groups
22	18	Metric weighing and measuring of foods
33	12	Crossword puzzles about food and nutrition
41	7	Discussions of nutrients in foods
21	18	Use of graphs or comparison cards to evaluate the amount of nutrients in specific foods
34	6	Discussions of functions of nutrients
25	14	Film or other audio-visual concerning meal planning
20	8	Planning school lunches and breakfasts
16	18	Decorative boards about food and nutrition for the cafeteria
28	13	Analyzing the nutrient content of specific foods
12	18	Discussions of worldwide food distribution
17	14	Planning for special diets
32	6	Discussions of nutrition-related diseases
32	10	Reading food labels and using the information in food selection
31	6	Planning nutritious snacks
28	15	Discussions of food advertising on television and how it affects students' food selection decisions
30	9	Discussions of food and food habits in relation to dental health

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Have Used	Could Use	
22	11	Preparing a unit on nutrition as a part of health
2	15	Working with the cafeteria manager to plan activities in the cafeteria
12	15	Inviting parents to have lunch with children at school
2	0	Other (specify): Preschool/nursery snacks

2. How often do you integrate nutrition education into your instruction?

13 Once a week
4 Once a month

31 Occasionally
15 Never
1 Daily

3. How often do you coordinate nutrition education activities with food service personnel?

0 Once a week
0 Once a month

10 Occasionally
52 Never

4. How often do you work with the cafeteria manager on nutrition education activities?

0 Once a week
0 Once a month

8 Occasionally
52 Never

5. Who should have responsibility for teaching students about nutrition? (Check all that apply.)

37 Myself
45 Science teachers
34 School nutrition specialist
33 County nutrition specialist
55 Home economics teachers
20 Building level food service manager

35 County services (e.g., extension agent, dental health, etc.)
50 Elementary teachers
24 School food service personnel
1 Parents
1 Health teacher

6. Which of the following media have you used to provide nutrition instruction in your school?

17 Instructional television
39 Films or filmstrips
14 Video cassettes
13 Audio cassettes
43 Posters
36 Industry instructional materials from food companies

25 USDA materials
19 County services materials (e.g., extension agent, dental health)
3 Other materials (specify): Dairy Council
2 Textbooks
4 Local Information
1 Contests, kids information
1 Teacher designed materials
1 Labels, cartons, food itself

7. How important is nutrition in relation to your health?

40 Extremely important   0 Not very important
25 Important   0 Not at all important

8. How important is nutrition in relation to the health of students?

39 Extremely important   1 Not very important
25 Important   0 Not at all important

9. Have you encountered any problems in teaching principles of nutrition?

30 No   11 Yes   22 Not Applicable

Which of the following problems have you encountered?

6 Materials are not readily available.
8 Money for materials is not readily available.
8 I don't know what is available.
1 I don't know which are accurate.
1 Equipment is not available.
6 I don't have enough training.
12 I don't have enough time.
7 I lack support.
5 Lack of student interest

10. Check each statement that applies:

15 I usually eat lunch in the school cafeteria.
0 I usually each breakfast in the school cafeteria.
0 I am working to get a breakfast program in my school.
1 I am working to implement a nutrition policy in my school.
35 I support policies that limit the selling of candy and soft drinks.
35 I integrate nutrition concepts into my classroom activities.
19 I see food service personnel as a resource in teaching nutrition.
28 I would like to have additional nutrition education materials.
25 I have suggested nutritious refreshments for classroom, faculty, or extracurricular functions.
38 I try to set an example by practicing good eating habits.
3 I coordinate nutrition activities with food service personnel.

11. Have you had any special training in nutrition?

22 Yes

What type of training have you had?
(Check all that apply.)

26 Basic nutrition course in college
10 Basic nutrition inservice training
17 Local workshops
11 American Dairy Council workshops
5 Extension agent workshops
2 Advanced Dairy Council Nutrition Courses
9 Professional association
1 Other (specify): reading material (American Cancer Society)
2 Advanced college courses

40 No

Why not?
(Check all that apply.)

15 Not relevant to my subject
3 Not interested
8 Not enough time
8 No training available
1 Other (specify): knowledge gained through life experience and reading
1 Not aware of training

12. What sources of nutrition information do you use regularly?

1 Food service personnel
2 Health food personnel
10 Professional journals (specify):____________________
25 Popular magazines (specify):____________________
41 Newspaper
28 Radio and television
19 Home economics teachers
7 Health teachers
11 Science teachers
8 Other teachers
12 School nurse
19 Family doctor
10 Friends
6 Other (specify): textbook, health fair, pamphlets, family
9 Not Applicable

16. Would you be willing to be trained to provide nutrition education and act as a resource person in your school to train others?

26 Yes 32 No 2 Possibly

17. What problems have you encountered when coordinating nutrition activities with meal activities or other cafeteria activities?

4 Lack of communication with food service personnel
9 Schedule conflicts
0 Health department regulations
2 Lack of materials
28 I have never attempted to coordinate these activities.
1 Other (specify): not enough time
28 Not Applicable

18. Have you worked with parents in helping students acquire good nutrition habits?

20 Yes

What have you done?

4 Invited parents to school activity
8 Invited parents to help prepare special dishes
5 Invited parents to field trips
13 Sent information home
16 Discussed nutrition with parents at conferences
1 Other (specify): favorite family recipe day

44 No

Why not?

25 Not my responsibility
5 Schedule problems
4 Parents not interested
16 Other priorities
1 Other (specify): have never been approached by parent about child's nutrition
1 Hadn't occurred to me to work with parents; do work with kids though
1 Not qualified and never asked
1 Inadequate facilities

Maryland Nutrition Education Needs Assessment

Teacher Questionnaire

Grade you teach

1	2-4	1	3-4
1	4-6	15	4
1	5-7	3	6-8
1	7	1	7-8
1	7-10	8	8
1	8,9	1	8-12
1	9	1	9,10
8	9-12	3	10-12
2	11	1	11-12

Specialty Area

1	Speech Language/Pathology
4	Science
1	All areas
11	Home Economics
2	Social Studies
3	English
1	French
1	Special Education
5	Math
1	Health
1	History
4	Elementary Education
1	Food Service
1	Arts
1	Physcial Education
1	Marketing
1	Language Arts
2	Family Life & Child Development

Years experience

1	½	1	1
2	2	5	3
1	4	1	5
1	6	1	7
2	8	2	9
1	10	4	11
1	12	1	13
1	14	5	15
1	16	1	18
1	19	1	20
1	21	1	23
1	25	1	26
1	27	1	28
1	30	1	31

12. What sources of nutrition information do you use regularly?

Professional journals:

Instructor
Discover
Consumer Reports
Science Digest
What's New in Home Economics
Harvard Medical School Newsletter

Popular magazines

Today's Health
Current health
American Health
Muscle & Fitness
Good Housekeeping
Redbook
Health
Ladies Home Journal
Better Homes
Time
Newsweek
US News & World Report
Southern Living Prevention
Woman's World
McCalls

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Maryland Nutrition Education Needs Assessment

Food Service Worker Questionnaire

DIRECTIONS: Please take a few minutes to answer each of the following questions or complete the statements below. When you have completed this questionnaire, place it in the attached envelope. Seal the envelope and return it to your principal.

Background Information

Your Age (Check one.)

1 Under 30
36 30 - 49
23 50 or over

Sex (Check one.)

48 Female
3 Male

Educational Level (Check one.)

18 Attended high school but did not graduate
37 Graduated from high school
3 Attended 2-year college or technical school
0 Attended 4-year college or technical school
0 Graduated from 2-year college or technical school
1 Graduated from 4-year college or technical school

Your Title: ______

Type of school in which you work (Check all that apply.)

22 Elementary
13 Middle
1 Combined Elementary
5 Junior High
27 Senior High
3 Other (specify): Junior/Senior High
1 Special Education

How long have you held your present position?

1 Less than one year
12 One to three years
15 Three to seven years
33 More than seven years

What was your last job before this one?

16 Food Service Worker
0 Other (specify): ______

How many months per year do you work in food service? ___

How many hours per week do you work in food service? ___

Briefly describe your responsibilities: ______

What do you like most about your job? ______

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Are you involved in nutrition education?

19 Yes
36 No

Training

1. How frequently do you attend training programs?

2 At least once a month
6 Several times a year, on a regular basis
25 Occasionally, not on a regular basis
25 Never
1 Daily (on-the-job training)

2. In which of the following areas have you received training during the past two years?

21 Quantity food preparation
23 Safety
29 Sanitation
11 Meal planning
27 Serving-Portion Control
7 Public relations
4 Merchandising
18 Nutrition
1 Other (specify): On-the-job training

Lunch Program

4. Which of the following persons or groups should be involved in menu planning? (Check all that apply.)

38 Students
21 Teachers
16 Parents
16 Principal
53 Food service personnel
1 Other (specify): State & Local Food Services

Nutrition

5. How important is nutrition in relation to your health?

42 Extremely important
18 Important
0 Not very important
0 Not important at all

6. What are the major problems you've had in using nutrition education materials?

8 Materials are not available.
5 Materials are hard to get.
9 I don't know what I need.
2 I don't have the money.
2 I don't know where to get them.
0 I don't know how to operate the audio-visual equipment.

7. How important is nutrition in relation to the health of students?

55 Extremely important
3 Important
1 Not very important
0 Not important at all

8. Have you worked with teachers on any of the following activities? (Check all that apply.)

2 Nutrition Mission
6 School Breakfast Week
7 School Lunch Week
4 Other Activities

9. Which of the following activities will you do with teachers to help students learn about nutrition? (Check all that apply.)

30 Tell students about the nutritional value of foods in the lunch
17 Circulate in the cafeteria during the lunch period and encourage students to eat complete meals
6 Be careful not to give extra large portions to overweight students
1 Other (specify): Make sure student has nutritious lunch before leaving line.

10. What would you like to see done in your school to promote nutrition education?____

____

11. How could you work with teachers to help students learn about nutrition?____

____

____

12. Who should have responsibility for teaching students about nutrition? (Check all that apply.)

32 Preschool teachers
33 Elementary teachers
14 Science teachers
23 Physical education teachers
48 Home economics teachers
34 School nutrition specialist
15 School nurse
29 School food service workers
17 Building level food service manager
24 County food service personnel
22 County nutrition specialist
17 County Services (e.g., Extension Agent, Dental Health, etc.)
12 Public health
12 Industry group (e.g., Dairy Council, Florida Citrus Commission)
33 Parents
0 Other (specify):________________________

13. Check column 1 for each of the activities in which you have taken part and column 2 for each activity in which you would be willing to take part.

	Column 1	Column 2
Activity	Have Participated	Willing to Participate
Tours of facilities	11	15
Tasting parties	14	16
Classroom presentations	0	9
Presentations to PTA	1	6
Presentations to faculty	2	4
Showing films or movies	1	9
Poster contest	6	14
Placemat contest	0	11
Special event days	9	13
Other (specify):	0	0

Support

14. Indicate the level of support for nutrition education you get from each of the groups listed below.

	Strong support	Moderate support	No support
Principal	19	13	6
Teachers	7	16	12
Cafeteria Workers	32	12	0
Students	4	21	11
Parents	1	17	14
Community	1	11	19
School Board	16	11	6

Maryland Nutrition Education Needs Assessment

Food Service Worker Questionnaire

Your Title:

38	Food Service Worker
9	Cook
2	Satellite Assistant
3	Manager/Ass't Trainee
1	Truck Driver

What was your last job before this one?

2	None
2	Daily newspaper
1	Headstart aide/sub.
1	Laundry
2	Domestic
1	Work in bindery
2	Cashier
11	Secretary/Receptionist/Clerk
10	Housewife

How many months per year do you work in food service?

48	10
1	9½
8	9
1	12

How many hours per week do you work in food service?

2	40
2	35
7	32½
16	30
2	27½
1	26
4	25
1	22
2	20
4	17½
2	15
1	14
4	12½
2	10
1	8
2	6
3	3

Food Service Worker Questionnaire, con't

Briefly describe your responsibilities:

41	Food Preparation
24	Cleaning
28	Money & ticket handling
8	Ordering
18	Serving
2	Inventory
1	Supervising
1	Menu planning

What do your like most about your job?

28	Children
5	Everything
6	Cooking
12	Hours
20	Staff
3	Contribution/Satisfaction
2	Learning
1	Variety
2	Paperwork
2	Cashier
2	Atmosphere

What would you like to see done in your school to promote nutrition education?

9	More signs/advertising
1	Develop Health Course
4	More communication about nutrition
1	Allow less freedom to purchase junk food
3	Have students eat balanced meals
1	Students knowing what eating right is all about
1	Kitchen tours
3	Committee of students to work with cafeteria workers to plan meals, suggest improvements, new items
1	Good behavior during meal times
3	Films
1	Parents involved

How could you work with teachers to help students learn about nutrition?

7	Talk to students/teachers about lunch program
1	Encourage students to eat their vegetables
1	Make food look nutritious
1	Encourage less food waste
2	Allow students in kitchen to watch food preparation
1	Posters and literature

SUPPLEMENT C

THE NUTRITION ASSESSMENT INVENTORY

Summary of Instrument Development

The Nutrition Assessment Inventory (NAI) was developed by a team of authors representing both the fields of nutrition and education, to provide an in-depth, comprehensive instrument which could be used in both needs assessment and evaluation of nutrition education and training programs. The team consisted of John L. Hayman, Eugene C. Lee, Donna J. R. Watson, Clara Ruth Hayman, and Valerie Knotts. The three-year development process of the NAI involved a content analysis of commercial materials in health and nutrition education, of the most recent textbook series in health education (Laidlaw and Scott-Foresman), and of city and state curriculum plans and objectives for nutrition education and training programs.

Reviews of the content analysis were made by specialists in the areas of education, health, and nutrition including directors of secondary education, health coordinators, directors of health and physical education, and health supervisors. These specialists represented large city school systems and state education agencies selected at random to insure the representativeness of the content across the country in all grade levels. Revisions in items and distribution of items were made following reviewer' comments. Subsequent revisions have been made based on feedback of users and potential users of the test. Table 1 shows the city and state departments of education consulted at some phase of NAI development, either for content or for review.

Table 1

City and State Departments of Education Consulted in the Development of the Nutrition Assessment Inventory

State	State	City
Alabama	New Mexico	Chicago
Arizona	New York	Houston
Arkansas	Oklahoma	Los Angeles
California	Oregon	New York
Florida	Pennsylvania	Philadelphia
Georgia	Texas	
Illinois	Virginia	
Louisiana	Washington	
Maryland	West Virginia	
Nebraska		

The NAI is a pencil and paper self-report measure that is concept-referenced. The five major concept areas, the sub-concepts, and the distribution of items were determined by the content analysis and from the weight given to the various concepts by the panel of reviewers. Different emphasis in the different levels (grades 1-3, 4-6, 7-9, 10-12, and adult) corresponds to the perceived nutritional and educational needs of the examinees considering their developmental stages.

The five concept areas covered in each of the five levels of the NAI are:

- Nutritional Requirements for Growth and Development
- Significance of a Balanced Diet

- Nutrients and Their Utilization
- Psychosocial Aspects of Food
- Food Sources, Processing, and Handling

Within these five concept areas, there are twenty-nine sub-concepts in the cognitive, affective, and behavior areas. The sub-concepts are listed below:

I. Nutritional requirements for growth and development
    A. Nutritional needs throughout the life cycle; nutrient needs for vulnerable groups such as infants
    B. Influence of age, sex, and activity on nutritional requirements

II. Significance of a balanced diet
    A. Basic four food groups
    B. Meal patterns
    C. Contribution of snacks to daily intake
    D. Contribution of school food service programs to daily nutrient requirements
    E. Importance of breakfast
    F. Nutrient content of various foods
    G. Emphasis on identification and acceptance of a wide variety of foods

III. Nutrients and their utilization
    A. Various nutrients and the physiology of their metabolism
    B. Deficiency states created by lack of various nutrients
    C. Overeating resulting in overweight and obesity
    D. Relationship of nutrition to health and disease
    E. Food sources of the various nutrients
    F. Caloric content of food
    G. Caloric needs for various levels of activity and/or different metabolic states such as growth

IV. Psychosocial aspects of food

   A. Psychological and emotional meaning of food

   B. Food and meals as a means of socialization

   C. Cultural factors influencing food selection

   D. Economic determinants of food selection

   E. Family, community, and world food problems

   F. Consumerism, food labeling, and control of safe food supply

   G. Health foods, food faddism

V. Food sources, processing, and handling

   A. Sources for different varieties of food

   B. Influence of agricultural practices and transportation methods of food supplies

   C. World distribution of food supplies

   D. Effects of modern processing on nutrient availability in foods

   E. Proper handling and storage of foods in the home

   F. Importance of sanitary practices in food preparation

The categories shown above and the standard version of the NAI were reviewed with representatives of the Food and Nutrition Branch in 1979 prior to the 1980 needs assessment. After some discussion, several items were deleted, and several more items were added. The changes were introduced to make the form of the NAI administered in Maryland schools more sensitive to the instruction given there and to yield information specifically needed by the State Department of Education.

Each of the four levels administered in Maryland is composed of three sections: knowledge, behavior, and attitude. Items within each section are further keyed to the concepts shown above. The next section describes the four levels of the NAI in terms of scales within each section. For example, within the knowledge section of each level there is a Growth and Development scale, a Balanced Diet scale, and so on. The number of items per scale varies from level to level and from section to section, reflecting the amount of emphasis desired by the representatives of the Food and Nutrition Branch.

Nutrition Assessment Inventory
Scale Descriptions Form 409-02-11/79

Intermediate Level
(Grades 4-6)

Knowledge (Section I)

Growth and Development: This scale contains six items (items 1, 2, 3, 5, 6, and 10). Students who score high on this scale generally understand the relationship between nutrient needs and the life cycle, are aware of the effects of exercise and activity on nutrient needs, and are aware that good nutrition starts at an early age.

Balanced Diet: This scale contains twelve items (items 4, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, and 18). Students who score high on this scale understand the importance of a balanced diet, can identify the four basic food groups, are aware of the place of snacks in their diet, understand the importance of breakfast, and are aware of the nutrient contents of a Type A school lunch.

Nutrients: This scale contains ten items (items 19, 20, 22, 23, 24, 26, 32, 38, and 39). Students who score high on this scale can identify the sources and uses of various specific nutrients and understand the relationship between calories and body weight.

Psychosocial Aspects of Food: This scale contains eight items (items 25, 27, 28, 29, 30, 31, 33, and 34). Students who score high on this scale are aware of various social, cultural, and governmental influences on the food we eat, are aware of the foods associated with other cultures, and understand the purpose of food advertising.

Food Sources, Processing, and Handling: This scale contains four items (items 35, 36, 37, and 40). Students who score high on this scale recognize steps in food processing, are aware of food additives, understand the relationship between cleanliness and health, and are aware of the fact that the amount of food available varies from one country to the next.

Behavior (Section II)

Growth and Development: This scale contains only two items. Generalizations about students who score high on this scale should not be made.

Balanced Diet: This scale contains eleven items (items 1, 4, 5, 6, 7, 8, 9, 10, 19, 22, and 23). Students who score high on this scale do the following every day: drink milk, eat fruit or drink juice, eat breakfast, eat the school lunch, and eat fresh fruits at home. These students rarely snack, always eat balanced meals when away from home, and are willing to try new foods.

Nutrients: This scale contains only three items. Generalizations about students who score high on this scale should not be made.

Psychosocial Aspects of Food: This scale contains eight items (items 12, 13, 16, 17, 18, 20, 21, and 25). Students who score high on this scale are influenced by other people and by television in making decisions about food, enjoy eating with other people, and often eat away from home.

Food Sources, Processing, and Handling: This scale contains only one item. Generalizations about students who score high on this scale should not be made.

Attitudes (Section III)

Growth and Development: This scale contains four items (items 2, 3, 4, and 9). Students who score high on this scale are concerned about the relationship between diet and growth, between diet and exercise, and believe that people should take an interest in their own physical development.

Balanced Diet: This scale contains nine items (items 6, 7, 8, 10, 11, 12, 13, 14, and 15). Students who score high on this scale believe in the importance of a balanced diet and in the importance of the basic food groups, like most foods, believe that school lunches are good, and are supporters of breakfast.

Nutrients: This scale contains seven items (items 16, 17, 18, 19, 20, 21, and 22). Students who score high on this scale believe that eating right leads to health and long life, are attracted to slim people, believe that overweight people should lose weight, and believe that people should drink more water.

Psychosocial Aspects of Food: This scale contains twelve items (items 1, 5, 23, 24, 25, 26, 27, 28, 29, 30, 33, and 34). Students who score high on this scale like to eat just about anything just about anywhere, believe that good food is economically obtainable, respect the food choices of friends and foreigners alike, and do not believe the government should tell them what to eat.

Food Sources, Processing, and Handling: This scale contains only three items. Generalizations about students who score high on this scale should not be made.

Nutrition Assessment Inventory
Scale Descriptions Form 409-02-11/79

Junior High School Level
(Grades 7-9)

Knowledge (Section I)

Growth and Development: This scale contains five items (items 1, 2, 4, 5, and 10). Students who score high on this scale understand the relationships among age, sex, exercise, and nutrient needs. These students also are aware of the changes in nutrient needs throughout the life cycle.

Balanced Diet: This scale contains six items (items 6, 12, 13, 14, 15, and 16). Students who score high on this scale can identify well-balanced meals, are aware of the role of the basic food groups, correctly identify the nutrient contents of a Type A school lunch, understand the importance of breakfast, and can identify nutritious meals and snacks.

Nutrients: This scale contains eighteen items (items 3, 7, 8, 9, 11, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 32, 34, and 36). Students who score high on this scale can identify the sources and uses of various specific nutrients and understand the relationship between calories and body weight. Student who score high on this scale also understand the difference between weight control through caloric intake and weight control through diet pills.

Psychosocial Aspects of Food: This scale contains eight items (items 27, 28, 29, 30, 31, 33, 35, and 37). Students who score high on this scale understand the influence of various government bodies on the availability and quality of various foods, are aware of the impact of food advertising, are familiar with vegetarianism.

Food Sources, Processing, and Handling: This scale contains only three items. Generalizations about students who score high on this scale should not be made.

Behavior (Section II)

Growth and Development: This scale contains only three items. Generalizations about students who score high on this scale should not be made.

Balanced Diet: This scale contains nine items (items 4, 6, 7, 8, 9, 10, 19, 22, and 24). Students who score high on this scale do not skip meals, choose nutritious snacks, eat breakfast and a school lunch every day, rarely spend money on junk food, eat a variety of foods at home, and generally have plenty of fresh fruits and vegetables to eat at home.

Nutrients: This scale contains five items (items 11, 12, 13, 14, and 15). Students who score high on this scale are calorie counters and prefer to control health and weight with food rather than with pills.

Psychosocial Aspects of Food: This scale contains six items (items 2, 16, 17, 18, 20, and 21). Students who score high on this scale are strongly influenced by friends and by television in deciding which foods to eat. These students prefer to eat food that looks good. They also are aware of the ingredients of the food they eat and generally read the labels on foods. Students who score high on this scale eat with their family and eat some sort of fast food nearly every day.

Food Sources, Processing, and Handling: This scale contains only one item. Generalizations about students who score high on this scale should not be made.

Attitudes (Section III)

Growth and Development: This scale contains six items (items 2, 3, 4, 8, 9, and 10). Students who score high on this scale believe that women should nurse their babies, appreciate the relationships among exercise, diet, and weight, are concerned about babies' diets, are sympathetic with the nutrition needs of athletes, and believe that they should be concerned about the relationship between what they eat and their own growth and development.

Balanced Diet: This scale contains seven items (items 5, 7, 11, 12, 13, 14, and 15). Students who score high on this scale believe that good nutrition and a balanced diet are important to everyone, believe that snacks can be harmful, like the school lunch, and like breakfast.

Nutrients: This scale contains ten items (items 1, 17, 19, 20, 22, 23, 24, 25, 26, and 27). Students who score high on this scale believe that junior high school students should be aware of the relationship between eating and health, believe that overweight teenagers should go on a diet and are attracted to slim people, believe that eating right is the key to good health, believe in counting calories, and do not agree that hunger should dictate the amount or time one eats.

Psychosocial Aspects of Food: This scale contains thirteen items (items 6, 16, 21, 28, 29, 30, 31, 32, 33, 34, 35, 36, and 37). Students who score high on this scale believe that learning about nutrition will improve their eating habits, like to eat nearly anytime with nearly anyone, respect the food choices of other people, believe that food food is economically available, are influenced by television and magazine ads, and believe that doctors know what's best about food.

Food Sources, Processing, and Handling: This scale contains four items (items 18, 38, 39, and 40). Students who score high on this scale are concerned about worldwide hunger, believe that additives are helpful rather than harmful, believe that the school cafeteria workers are concerned about food wastage.

Nutrition Assessment Inventory
Scale Descriptions Form 409-02-11/79

Senior High School Level
(Grades 10-12)

Knowledge (Section I)

Growth and Development: This scale contains six items (items 1, 2, 3, 5, 6, and 8). Students who score high on this scale recognize the relationship between age, sex, exercise, and dietary needs and are aware of the impact prenatal nutrition.

Balanced Diet: This scale contains six items (items 9, 10, 11, 12, 13 and 14). Students who score high in this scale are able to recognize well-balanced meals, can place foods properly into the appropriate basic food group, are aware of the nutrient content of a Type A school lunch, and recognize the importance of breakfast.

Nutrients: This scale contains twenty items (items 4, 7, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 31, 32, 33, 34, and 36). Students who score high on this scale can correctly identify the source and function of specific nutrients, are aware of the relationship between dietary supplements and health, understand the relationship between calories and weight, and understand where calories come from.

Psychosocial Aspects of Food: This scale contains four items (items 28, 29, 30, and 35). Students who score high on this scale are cognizant of the impact of federal regulatory agencies upon the availability and quality of food, understand the concept of food labeling, and correcting identify the nature of vegetarianism.

Food Sources, Processing, and Handling: This scale contains four items (items 37, 38, 39, and 40). Students who score high on this scale recognize the concept of food processing, correctly identified four to five foods, understand the relationship between cooking time and nutrient content of food, and recognize the consequences of improper food storage and handling.

Behavior (Section II)

Growth and Development: This scale contains only two items. Therefore, generalizations about students who score high on this scale should not be made.

Balanced Diet: This scale contains fifteen items (items 2, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 27, 29, 31, and 38). Students who score high on this scale eat nutritious foods at home, eat good foods even when they are in a hurry, rarely skip meals, almost always eat fruits and vegetables, rarely snack, plan their meals ahead of time, eat lunch in the lunchroom, eat breakfast every day, eat a variety of foods, choose the foods they eat based on characteristics other than taste, rarely leave food on their plate, rarely eat junk food, and eat fresh fruits and vegetables every day.

Nutrients: This scale contains nine items (items 1, 9, 16, 17, 18, 20, 21, 22, and 23). Students who score high on this scale are conscious of the relationship between caloric intake and body weight, rarely use vitamin or mineral supplements, often go on a diet to lose weight, eat foods low in fats and cholesterol, eat foods that are high in fiber.

Psychosocial Aspects of Food: This scale contains twelve items (items 3, 24, 25, 26, 28, 30, 32, 33, 34, 35, 36, and 37). Students who score high on this scale eat away from home frequently, are influenced by their friends and other people in making decisions about food, eat with families, help with grocery shopping, are aware of food labeling, and eat health foods or organic foods frequently.

Food Sources, Processing, and Handling: This scale contains only two items. Therefore, generalizations about students who score high on this scale should not be made.

Attitudes (Section III)

Growth & Development: This scale contains only three items. Therefore, generalizations about students who score high on this scale should not be made.

Balanced Diet: This scale contains eleven items (items 2, 3, 5, 9, 10, 11, 12, 13, 14, 15, and 25). Students who score high on this scale believe in the importance of balanced diet and of the school lunch, believe that soft drinks may be harmful, believe in the importance of breakfast, do not believe that people should eat only what they like, believe that they should eat a variety of foods, and feel that breakfast should be made available at school.

Nutrients: This scale contains eight items (items 7, 16, 18, 20, 21, 23, 24, and 30). Students who score high on this scale are concerned about the relationship exercise and diet, do not believe that people should take vitamins, believe that overweight people should lose weight, and believe that good diet is the key to good health.

Psychosocial Aspects of Food: This scale contains fifteen items (items 1, 4, 17, 19, 22, 26, 27, 28, 29, 31, 32, 33, 34, 35, and 36). Students who score high on this scale believe that food manufacturers try to make their foods appear nutritious, would rather eat with their families, believe that food that is available is nutritious, believe most of the nutrition information that they come into contact with, like to eat, believe that people have problems changing their food habits, believe that learning about nutrition will improve their eating habits, and believe that the government should provide free meals to school students.

Food Sources, Processing, and Handling: This scale contains only three items. Therefore, generalizations about students who score high on this scale should not be made.

Nutritious Assessment Inventory
Scale Description Form 409-02-11/79

Adult Level

Knowledge (Section I)

Growth and Development: This scale contains six items (items 1, 2, 3, 4, 5, and 7). Individuals who score high on this scale are aware of the impact of prenatal nutrition on fetal growth and development, recognize that persons have varying nutrient needs throughout the life cycle, can identify the nutrients that aid the growth and development of bones.

Balanced Diet: This scale contains six items (items 9, 10, 11, 12, 13, and 14). Individuals who score high on this scale can identify the basic food groups, know how many servings of fruits and vegetables individuals need each day, can identify a balanced meal and snack, recognize the importance of breakfast, and can identify the nutrient contents of a Type A school lunch.

Nutrients: This scale contains twenty items (items 6, 8, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 33, 34, and 36). Individuals who score high on this scale properly identify the source and function of various nutrients, know when water-soluable and fat-soluable vitamins should be replaced, and understand the mathematical relationship between calories and body weight.

Psychosocial Aspect of Food: This scale contains five items (items 28, 29, 32, 35, and 38). Individuals who score high on this scale understand the purpose of food labeling, can properly identify the child nutrition program, know what a vegetarian is.

Food Sources, Processing, and Handling: This scale contains only one item. Therefore, generalizations about individuals who score high on this scale should not be made.

Behavior (Section II)

Growth and Development: This scale contains only one item. Therefore, generalizations about individuals who score high on this scale should not be made.

Balanced Diet: this scale contains nine items (items 2, 5, 6, 7, 8, 9, 10, 23, and 19). Individuals who score high on this scale rarely leave food on their plates, and eat fresh fruits or vegetables every day.

Nutrients: This scale contains ten items (items 1, 3, 11, 12, 13, 14, 15, 16, 17, and 18). Individuals who score high on this scale are concerned about and try to learn about childrens' nutrition, often go on a diet to lose weight, count their calories, eat diet foods, eat foods that are high in fiber and low in cholesterol, are conscious of the relationship between food choices and health, rarely take vitamin or mineral supplements, and have never had a nutritional deficiency.

Psychosocial Aspects of Food: This scale contains nine items (items 19, 20, 21, 22, 24, 25, 25, 27, and 28). Individuals who score high on this scale are strongly influenced by television, other people, and the appearance of food; eat fast foods, are conscious of food labeling, and are inclined to change their eating habits as they learn more about nutrition.

Food Sources, Processing, and Handling: This scale contains no items.

Attitudes (Section III)

Growth and Development: This scale contains only one item. Therefore, generalizations about individuals who score high on this scale should not be made.

Balanced Diet: This scale contains eight items (items 1, 6, 7, 9, 11, 19, 29, and 30). Individuals who score high on this scale believe that breakfast should be available at school, believe that snacking can be harmful, believe in the benefits of the school lunch program, believe that eating breakfast is important, believe that people should eat a wider variety of foods.

Nutrients: This scale contains five items (items 4, 8, 14, 15, and 18). Individuals who score high on this scale are concerned about the relationship between exercise and diet, do not believe in taking vitamin and mineral pills, do not believe that appetite is the best predictor of amount of food needed, and believe in the relationship between good eating and good health.

Psychosocial Aspects of Food: This scale contains fifteen items (items 2, 3, 10, 12, 13, 16, 17, 20, 21, 22, 23, 24, 25, 26, and 27). Individuals who score high on this scale believe that learning about nutrition will improve eating habits, believe the nutrition information available to them, believe that the government should provide free meals to school students. believe that the school cafeteria is a living nutrition laboratory, believe that foods available today are just as nutritious as those available several years ago, prefer to eat with their families, believe that manufacturers try to make their food products appear nutritious, enjoy eating with other people, believe that the quality of food is the most important aspect of food, and believe that most families spend too much money on junk food.

Food Sources, Processing, and Handling: This scale contains only three scored items. Therefore, generalizations about individuals who score high on this scale should not be made.

TEST BOOKLETS AND MANUAL

Form 409-02-11/79

Intermediate Level

Junior High Level

Senior High Level

Adult Level

Copies of the booklets and manual may be obtained from the Educational Support Services Branch of the Maryland State Department of Education.

NUTRITION ASSESSMENT INVENTORY RESULTS

Results are on file with the Educational Support Services Branch of the Maryland State Department of Education

Procedures

Frequency distributions have been performed for each variable for each test. Variables include demographic data (sex, race, type of school) and all items. For all items, distributions of raw responses (A,B,C,D, Agree, Disagree) and scored responses (0,1) were calculated. Internal consistency coefficients were also calculated for each total test. Means and standard deviations were calculated for each test and subtest described in the previous section.

Comparisons of 1986 results with 1980 results were at the item level, due to the absence of subtest and test level data for 1980. Z statistics for the difference in proportions were calculated as follows:

$$Z = \frac{p_{86} - p_{80}}{\sqrt{p_o q_o / N_{86} + p\ q\ / N_{80}}}$$

where p_{86} and p_{80} refer to proportions responding in a particular way in 1986 or 1980, N_{86} and N_{80} refer to numbers of respondents in 1986 and 1980, and p_o and q_o are defined as follows:

$$p_o = \frac{N_{86}\ p_{86} + N_{80}\ p_{80}}{N_{86} + N_{80}}$$

and $q_o = 1 - p_o$.

The Z statistic is normally distributed with a mean of 0 and a standard deviation of 1. The level of Z required to test the differences in such a way that significance could be achieved by chance only once in 100 comparisons was 2.577.